

The Sight-Saving Review

Volume XXIII

Number 2

Summer, 1953

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The National Society's 1953 Conference

ANNOUNCING "Better Sight for Tomorrow" as the theme of the National Society's Annual Conference, President Mason H. Bigelow welcomed the delegates at the opening session on Wednesday morning, March 18. Several hundred eye health and safety specialists representing the fields of medicine, public health, education, government and industry were gathered in the Penn Top of New York's Hotel Statler where the three-day meeting was held.

Reviewing the battles against blindness won since the Society's campaign began in 1908 Mr. Bigelow cited the reduction in ophthalmia neonatorum, the disease that formerly was responsible for 40 per cent of all blindness among children, as compared with today's figure of one per cent. In the last 14 years, he reported, "loss of sight due to syphilis has been cut in half; eye injuries among the young have decreased 30 per cent.

Public Education Needed

"But our campaign must be continued on many fronts," Mr. Bigelow emphasized. "We must intensify our public education efforts since the greatest cause of blindness today is simple neglect; and we must discover ways to prevent certain blinding eye diseases."

Correcting false ideas about eye conditions is one of the chief public education problems Mr. Bigelow said;

for example, it is often difficult to convince the parents of a child with crossed eyes that he will not "grow out" of this condition and that early treatment is of the utmost importance. Another example is glaucoma. Blindness from glaucoma can usually be prevented if the disease is found and treated early enough. But an estimated 800,000 men and women over 40 are slowly losing their sight from glaucoma—many of them without knowing they have the disease.

Referring to the progress reports on all phases of sight conservation that were to be presented at the conference President Bigelow voiced appreciation to the delegates who had come from many parts of the United States. "On behalf of the many thousands of men, women and children whose sight your interest will save in years to come," he said, "I would like to express deepest thanks to you. With your help I am certain that better sight for tomorrow will become a reality today."

At the opening session Dr. Franklin M. Foote, executive director of the National Society, also referred to the need for expanding eye research, education in eye care and services such as vision screening, and accident prevention. "During 1952," he said, "our Research Committee awarded a total of \$30,000 in grants for the study of diseases causing blindness. This, of course, is only a very small part of what is actually needed. Retrolental

fibroplasia, for example, has increased to the point where it is now the chief cause of blindness among preschool children. And still we do not know the causes of most glaucoma and cataracts, two major sight-robbing diseases."

Six Sessions Held

The six main conference sessions, Wednesday through Friday, dealt with "Opportunities for Improving and Restoring Sight," under the chairmanship of W. G. Smillie, M.D., professor of public health and preventive medicine, Cornell University Medical College; "Vision Testing in the Light of the St. Louis Research"—chairman, Franklin M. Foote, M.D.; Education of Partially Seeing Children"—chairman, Mrs. Dorothea DiPretoro, Hunter College lecturer and former acting director, braille and sight conservation classes, Board of Education, New York City; "New Developments in Industrial Vision Programs"—chairman, J. E. Nichols, supervisor of safety, Reynolds Metals Company; "Review of Current Scientific Knowledge"—chairman, Eugene M. Blake, M.D., clinical professor of ophthalmology, emeritus, Yale University; and a panel on "Special Problems in Preventing Blindness"—chairman, Ira V. Hiscock, Sc.D., chairman, Yale University Department of Public Health.

Papers in this Issue

Several of the papers presented by the various speakers at these sessions appear in this issue; others will be covered in the Fall issue of the REVIEW.

Conference highlights were summarized at the luncheon on the closing

day by Mrs. Dorothy Dunbar Bromley, distinguished author and journalist, who for some years has been interested in the National Society's work. Mrs. Bromley expressed satisfaction in observing that this was truly a working conference and that the various papers reflected much activity and progress in the expanding program to conserve and restore sight.

Referring to medical advances in the control of glaucoma, Mrs. Bromley cited the case of her own mother who has for some time suffered from this disease, yet at the age of 90 has useful vision. She touched on other areas of progress such as current research on retrolental fibroplasia and other blinding diseases; vision testing of school children; prevention of eye injuries in industry and elsewhere; public services for persons needing eye care; and mechanical aids for the partially sighted.

Featured in connection with the conference were interesting exhibits relating to orthoptic and vision testing techniques, prevention of eye accidents to children, public eye health services, optical aids, large type books for the partially seeing, and control of eye diseases.

President Bigelow adjourned the conference with the announcement that the 1954 meeting would be held in St. Louis.

Next Year's NSPB Conference

March 10-12, 1954

Hotel Jefferson

St. Louis, Mo.

Progress in the Study of Retrolental Fibroplasia

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With almost 200 investigators working on retrolental fibroplasia, many ideas relating to its cause and cure are being proposed and tried out, and the disease is being attacked from many angles.*

RETROLENTAL fibroplasia, which occurs almost exclusively in premature babies of low birth weight, is at present considered to be a disease of the retina and vitreous. The clinical course may include retinal vessel dilatation and tortuosity, vitreous hazing, retinal edema and transudation, hemorrhage into the retina and vitreous, neovascularization, retinal detachment and retrolental membrane formation.

In a recent editorial on retrolental fibroplasia in the *Journal of the American Medical Association* (September 20, 1952) the editor stated, quite correctly, that the causative agent of retrolental fibroplasia is unknown and that no effective therapy has been discovered. This statement is true, and superficially no different from what might have been said five or more years ago. Actually, the situation has changed markedly in many respects, some encouraging, some less so.

Considering the discouraging side first: In the last ten years the disease, which formerly was relatively rare, has become the most common cause of infant blindness in the United States.

* A paper presented at the Annual Conference of the National Society for the Prevention of Blindness, New York, March 1953.

Its true incidence is hard to determine. Knowledge of the disease is too new, the reports of incidence from the various clinics are often not comparable, and, very important, the diagnostic criteria are not yet clearly defined. (An attempt to standardize the description of the disease and its diagnosis is at present being made.)

Further complications are added by the constant alteration in the number of cases, their distribution and severity. In the last two or three years the disease has appeared in parts of this country and in other parts of the world where it had not previously been found. In certain regions where it had been well established, it appears to have abated both quantitatively and qualitatively, so that cases have become fewer and less severe, for no apparent reason. In some cities it has appeared in certain hospitals and not in others.

Facts Apparently Established

Certain facts appear to have been established:

The incidence is, in general, reported to be rising. However, the elevated incidence is not necessarily main-

tained, and fluctuations occur. For example, at the Boston Lying-In Hospital, where the disease made an early appearance, the incidence has followed a course of initial rise and subsequent fluctuation which may be characteristic of other clinics as well.

The disease is spreading. The early reports on retrolental fibroplasia appear to have been confined, formerly, to a few regions in the United States (Massachusetts, New York, Illinois). During the last two or three years, however, cases have been seen and reported from widely distributed hospitals all over the United States. These more numerous reports may be accounted for not only by increased knowledge and awareness of the disease, but also by its actual appearance in regions where it had not previously existed. Reports indicate that, once informed about the disease, ophthalmologists made careful examinations for many months or even several years before encountering a single case. The group in Baltimore, on the basis of eye examinations of all premature infants born at their hospital from 1935 on, state that the disease appeared for the first time in their hospital in 1945.

Similarly, but to a lesser degree, it is appearing outside the United States. In England, there were no cases before 1945, and very few from 1945 to 1949. Since then, in that country, the disease has become the major cause of pre-school blindness. In the last few years, reports of retrolental fibroplasia have come from Canada, France, Norway, Sweden, Denmark, Holland, Belgium, Switzerland, Germany, Italy, Australia, Cuba, Israel, South Africa and Japan. The Irish ophthalmologists report that with extensive search

they have to date seen no retrolental fibroplasia in Ireland.

The rise in incidence of retrolental fibroplasia in the last decade is considered by most investigators to be much greater than the rise in survival rate of premature infants during the same period.

Many Investigators at Work

Encouragement lies in the fact that interest in the disease has increased enormously. Whereas five years ago only a few groups were concerned with it, there are now almost 200 investigators who are working and publishing in the field. And more and more physicians are learning about the disease and how to recognize it.

Because of the increased interest and knowledge, the whole concept of the disease has altered. In those centers where work is being done (and these spread all over the United States and many countries abroad), all premature babies of low birth weight receive eye examinations at regular intervals from birth, so that the development of the disease has been watched and described, and knowledge of its clinical course is growing. In addition, the pathologic morphology of the disease is being well described.

Also, it is now recognized that retrolental fibroplasia may occur in a mild form as well as in a severe form. The disease does not always reach its end point of membrane formation and blindness; in a certain number of babies it is arrested or even regresses spontaneously. Knowing how many cases subside spontaneously is essential in judging the effects of any attempted therapy.

With so many workers now in the field, many ideas of the cause and cure

are being proposed and tried out, and the disease is being attacked from many angles.

Considerations Ruled Out

The research, so far, has failed to give positive information about the cause or prevention of retrolental fibroplasia, but it has at least made it possible to rule out certain considerations. For example, it has been demonstrated that the disease is not caused by the premature exposure of the retina to light, nor by the water-miscible vitamin preparations which have been in use during the past ten years, nor by a deficiency of vitamin E. It has been shown that weekly transfusions of blood from women in their last trimester of pregnancy will not protect premature infants from retrolental fibroplasia. And it has also been demonstrated (to the satisfaction of many of us) that the adrenal cortex hormones, ACTH and cortisone have no effect on the course of the disease. It should be mentioned that in the experiments made with vitamin E and with the adrenal cortex hormones, the results at first looked very promising. However, when controlled experiments on sufficiently large groups of babies were done, it became evident that these agents were ineffective in either curing or preventing retrolental fibroplasia.

Many investigators suggest in their writings that the disease may be caused by a virus. In some ways it resembles a virus disease; e.g., its sudden appearance, its manner of spread to new places, its presence in one hospital in a city and not in another, its variations in severity. Working with viruses, and establishing the fact that a disease is of viral origin is

extremely difficult, and as far as I know almost no exploration has been made in this field. The suggestion that a virus causes the disease has much to recommend it and I hope that it will be thoroughly investigated very soon, by our group and others.

Current Research

As to research which is going on at present:

1. Feeding. Since one of the earliest signs of retrolental fibroplasia is an edema of the retina, the differential use of breast and cows' milk has been of interest as a possible causal factor in the disease, chiefly because of the higher electrolyte content of cows' milk and its association with edema of the newborn. This use of one milk rather than the other, or the change from human to cows' milk at a particular point in the babies' development is now under consideration.
2. Since retrolental fibroplasia was seldom if ever seen in the obstetrical hospital of the Boston group before 1938, it has been suggested that perhaps the occurrence of the disease is related to some aspect of infant care which has been introduced since that time. For this reason the hospital, after very careful pediatric consideration, has attempted to revert to the methods of care of premature babies which existed before 1938. This study is now being made.
3. Another sort of research that is going on is based on the idea that very careful study of many aspects of the premature infant's physiology and biochemistry might reveal some basic difference between babies who develop retrolental fibroplasia and those who do not. This kind of study is now being carried on.

4. It has many times been suggested that some factor in the medical history of the mother or father might be the cause of retrolental fibroplasia. A number of studies along these lines have already been made. So far, no such factor has been found. It may, nevertheless, be true that a more detailed and systematic study, in many clinics, of the antenatal history of all mothers of premature babies of the susceptible birth weight group might prove valuable. Such a re-examination is now being made by the Boston group, with the hope that some differences may emerge between the mothers of babies who develop retrolental fibroplasia and those who do not.

5. The most active interest at present is in the use of oxygen for premature babies. For many years well equipped hospitals have given oxygen to premature infants routinely. At first the oxygen was supplied to the baby by means of a mask or a simple tent, and the babies got only moderate amounts of it. In later years oxygen in larger amounts has been much more generally used. It became more easily available, and the equipment for administering it to the babies was much improved. The present routine in the better-equipped hospitals is to place the new babies in closed incubators where the supply of oxygen can be more or less controlled. When it is judged that oxygen is no longer needed, the infant is gradually weaned off.

Use of Oxygen Studied

Two schools of thought have recently arisen concerning the relation of the present day use of oxygen to the development of retrolental fibroplasia. One school (basing its reasoning on the fact that a lack of oxygen during

development may give rise to certain malformations) says that the babies develop the disease either because they don't get enough oxygen (anoxia) or because, once having been given extra oxygen, they become accustomed to this additional supply. When this is diminished too rapidly, they develop relative anoxia, which gives rise to retrolental fibroplasia. This group claims that they can prevent or even cure retrolental fibroplasia by the proper use of oxygen, and can produce the disease by removing a premature baby suddenly from an atmosphere of high oxygen concentration.

The other school thinks that it is the high concentration of oxygen itself which causes the disease. This school claims that in their clinics they had very few or no cases of retrolental fibroplasia before the more efficient methods of giving supplementary oxygen were introduced, and that the rise in incidence of retrolental fibroplasia correlates with the increased use of oxygen in their hospitals. They claim further that the incidence drops when the amount of oxygen is lessened. To this strange controversy, in which one group states that retrolental fibroplasia develops because babies don't get enough oxygen, and another group claims that the disease is caused by giving premature babies too much oxygen, further confusion is added by the fact that there are hospitals using large quantities of oxygen where very few cases of retrolental fibroplasia are seen, and other hospitals where oxygen is also liberally used which have many cases. Also there are reports of cases of retrolental fibroplasia in babies who never received supplementary oxygen. To settle this controversy, more precise investigation of the true

correlation between the increased use of oxygen and the increased incidence of retrolental fibroplasia must be made. The answer may perhaps come from two sources: the results of actual controlled experiments, coupled with what can be learned from an examination of data which already exists.

An example of an actual experiment may be found in the report of a group working in Baltimore and Washington. The experimental group of premature infants was given a high concentration of oxygen for a long period, and weaned out of the oxygen very slowly so that the babies could adjust to the change. The control group of premature infants was given only moderate amounts of oxygen for a shorter period, and taken out of oxygen rather quickly. Twenty-five per cent of the babies in the first group developed severe retrolental fibroplasia, whereas none in the second group did. For these reasons, these investigators feel that there is a strong suggestion that the use of high concentrations of oxygen is a factor in the pathogenesis of retrolental fibroplasia, although many more rigidly controlled observations will be needed to establish this concept.

As to the study of existing data, much can be learned from records of what has occurred in the past, provided that the data are correctly examined and interpreted. It is not enough to observe that the incidence rose at about the same time that the increased use of oxygen occurred. One must be certain that both phenomena *really* coincided, and even then, that they are actually related to each other and not both related to a third factor. One must take into account other changes which have also occurred. And, very important, one must bear in

mind that in the experience of clinics where the disease has been of long standing it has been seen that the incidence undergoes significant fluctuations from year to year, when no known change in the care of premature infants has occurred. It is evident that conclusions cannot be drawn from a small number of cases or from fluctuations of incidence over a short period of time.

Future Investigations

In the search for the cause of retrolental fibroplasia, and ultimately its prevention or cure, it must be borne in mind that many of the suggested causes of retrolental fibroplasia (for example, anoxia, edema, hypoadrenalism) existed when the disease was still relatively rare. If one accepts the fact that the rise in incidence of retrolental fibroplasia has been higher than the increased survival rate of premature babies, one cannot regard any one of these factors as the sole etiologic agent.

The condition of prematurity, which is the primary prerequisite for susceptibility to retrolental fibroplasia, is not sufficient, and no factor which existed before the incidence became high can by itself be regarded as an adequate cause. The answer must be sought in an interaction of intrinsic factors associated with prematurity, and extrinsic factors, the introduction of which can be clearly correlated with the actual rise in incidence of the disease.

PAMPHLET ON DEFICIENCY DISEASES

A reprint of Dr. Arthur M. Yudkin's article on "Deficiency Diseases in Relation to the Eye" that appeared in the last issue of the REVIEW is now available from NSPB. Pub. 167; price 5 cents.

Glaucoma—A Review of Current Knowledge

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Tonography, fluorometry and observation of the aqueous veins are new methods that have proved to be very productive in the study of this sight-destroying disease.*

WE are living in an era of very active and productive research as far as glaucoma is concerned. Optimism and hopefulness prevail among the investigators, principally because they have discovered methods for the measurement of the rate of aqueous flow through the chambers of the intact human eye.

Largely through experiments on laboratory animals it has become firmly established that the highly specific, crystal-clear fluid that fills the chambers of the eye is in a state of steady motion or flow, the principal direction of which is from the posterior chamber through the pupil into and toward the angle of the anterior chamber where the main fluid exits are located. The aqueous may be likened to a slowly moving body of water or stream with headwaters in the valleys and recesses between the ciliary processes. Twice in its intraocular course this body of water forms a lake, in the posterior and anterior chambers. There the river bed is wide and the flow correspondingly slow. Between the two lakes is interposed a narrow passage, the pupil, through which the aqueous passes more swiftly. At the edge of the

second lake microscopic pores lead into a labyrinth of intercommunicating narrow tissue clefts at the far end of which the aqueous collects in a circular channel with a distinct wall, the canal of Schlemm. Multiple tiny tubules connect the canal of Schlemm with the venous part of the blood vessel system of the eye.

Flow Depends on Two Factors

As long as the fluid system of the eye is in its normal state of equilibrium, the rate of flow is the same in every section of the system, the speed varying inversely with the cross section of the river bed. The greatest resistance to flow is probably encountered within the labyrinth upstream of Schlemm's canal and perhaps also at the beginning of the latter's tubular outlets. To overcome this resistance energy is necessary which is derived partly from the pumping action of the heart and partly through energy-producing chemical processes in the ciliary body. These two forces combined "make" (that is manufacture) aqueous at a rate just right to fill the fluid spaces within the eye and moderately distend the eyeball wall, putting it under moderate tension or pressure. This tension serves to give the eyeball its fairly stable shape, length and width. The

* A paper presented at the Annual Conference of the National Society for the Prevention of Blindness, New York, March 1953.

intraocular pressure or ocular tension is considerably greater than the pressure in the outlets of Schlemm's canal, and it is because of this pressure gradient that the aqueous flows. Its rate of flow has been determined by several different methods and been found to be about 2 cu.mm. a minute in the rabbit. In the light of the foregoing, the rate of aqueous flow depends upon two principal factors, the resistance to outflow and the rate of aqueous production.

Firmly established and precisely measurable in the eye of the rabbit, the steady flow of aqueous has also been shown to exist in the eye of man although here, until fairly recently, the evidence has been quite incomplete and indirect. Just within the last few years methods have been developed to measure the rate of aqueous flow in the human eye without appreciably disturbing its normal state of equilibrium or causing any great discomfort or inconvenience. The new methods are tonography, fluorometry and observation of the aqueous veins.

Tonography

Tonography consists, in principle, of prolonged tonometry, that is the prolonged application to the anesthetized eye of an accurate tonometer which is connected with an apparatus for continuous recording of the ocular tension. This recording, the tonogram, looks like and essentially is a recording of the fluctuations of blood volume within the eye, brought on by the heart beat, respiration and extraneous factors causing changes in blood pressure and blood distribution. Besides, the tonogram reveals a more or less steady decrease in ocular tension, indicative of a more or less steady decrease

in the volume of the ocular contents. Such decrease in volume can only be due to expulsion of aqueous or blood. It is caused by the increase in intraocular pressure resulting from the application of the tonometer. The magnitude of the increase in intraocular pressure resulting from the action of the tonometer has been determined by laboratory methods, that is on enucleated eyes. Tonography may be defined as the measurement of the amount of eye fluid expelled due to the rise in intraocular pressure, that is aqueous-propelling force, brought about by the tonometer.

It should be realized that the data provided by tonography alone are to some extent equivocal. The gradual decrease in the volume of the ocular contents—which is what normally happens during tonography—theoretically at least is the algebraic sum of several components, all being volume changes. A reduction in the amount of fluid production during tonography can produce a decrease in the volume of ocular contents.

In the rabbit Becker and Friedenwald of Johns Hopkins University found that the application of the tonometer may depress the rate of fluid production. In other words, several different processes, several unknowns, enter into the tonographic result. Thus there is the need for collateral information which has been provided, partly at least, by direct observation of the so-called aqueous veins, discovered over 10 years ago by Ascher of Cincinnati. These are clear fluid-containing channels on the anterior aspect of the globe close to the corneoscleral junction which have proved to be direct outlets of the canal of Schlemm. These veins communicate

freely with blood-carrying veins and, therefore, are subject to the same variations in caliber, contents and speed of flow as any other part of the vascular system. The flow of clear fluid in these aqueous veins can be observed closely in the living human eye, with a minimum of disturbance to the eye, and has been found to reflect fairly closely, though probably not in an exactly quantitative manner, the outflow of aqueous from the canal of Schlemm. Accelerated outflow from the canal manifests itself usually as a visible acceleration of flow within or widening of the aqueous veins.

Observations of aqueous veins during tonography makes the latter less equivocal. If during a period of rapid decrease in volume of ocular content indicated by tonography the aqueous vein under observation shows markedly accelerated flow, it is likely that the decrease in ocular contents is largely an aqueous outflow phenomenon. If during a period of decrease in ocular contents volume the flow in the aqueous veins comes to a standstill there is a strong possibility that the decrease in ocular fluid volume is due to cessation of fluid production.

Fluorometry

One other method for observing the rate of flow of the aqueous is fluorometry, that is the observation of the rate at which the dye fluorescein, an inert and innocuous agent, appears and disappears from the aqueous after either intravenous injection or instillation into the conjunctival sac. In either case the fluorescein diffuses into the aqueous where it can be seen and its concentration be determined in the intact, undisturbed human eye. More rapid flow through the chamber mani-

fests itself as a more rapid drop in fluorescein concentration.

These auxiliary methods have facilitated the interpretation of the tonographic result. They have furnished strong support for the concept that tonography records the facility of aqueous outflow from the eye under conditions of external pressure. It is important to realize that the escape of aqueous under pressure is a physiologic function of the eye and that tonography, therefore, is a test for the capacity of the eye to regulate its pressure. Since the regulation of the intraocular pressure is disturbed in the glaucomas it was to be expected that in this disease tonography would give information similar in value to that of the glucose tolerance test in diabetes or the basal metabolism test in hyperthyroidism.

The facility of outflow as measured by tonography varies within rather wide limits in normal eyes. Some of the factors responsible for these fluctuations have been recognized. A characteristic reduction of the facility of outflow occurs during menstruation. Other factors are being investigated. Eyes affected with chronic glaucoma, as a group, show a very much lower facility of outflow than a representative group of nonglaucomatous eyes, but there is considerable overlapping between the groups. These are some of the questions that are now being studied: Is the facility of outflow of the glaucomatous eye as variable as that of the normal eye? What is the relationship between the glaucomatous optic nerve disease and the facility of outflow? Does the latter become more and more impaired as the disease progresses? In patients with more advanced glaucoma in one eye is there a

difference between the facilities of outflow of the two eyes?

Data pertaining to these questions are slowly coming in, indicative of a progressively impeded fluid outflow as a characteristic of the chronic glaucomas. The site and nature of the obstruction may be expected to become definitely established within the next few years. That event may be expected greatly to improve our understanding of the mechanism of the glaucomas, as well as to increase the effectiveness of the treatment. The discovery of the site of the obstruction in the drainage channels may even point out possibilities of preventing glaucoma.

Dr. Lawrence T. Post Honored

Tribute was paid to Dr. Lawrence T. Post of St. Louis for his years of outstanding service to public health and welfare in a series of testimonial lectures on ophthalmic research on March 27 and 28, 1953.

Addressing more than 300 guests at the dinner in St. Louis' Park Plaza Hotel on March 28, Dr. Franklin M. Foote, NSPB executive director, cited Dr. Post's unselfish devotion to the cause of blindness prevention.

"Physicians who have teaching and research responsibilities, in addition to a busy ophthalmic practice," he said, "find their time more than taken up with the many medical and surgical aspects of treating eye conditions. Most ophthalmologists find it a nearly insurmountable problem to set aside time to serve community, state or national public health and welfare agencies. Yet, Dr. Post did take time from his many other responsibilities to help

organize and to guide many sound programs for the prevention of blindness that will reach far more men and women than he ever would have been able to see in office or clinic.

"Undoubtedly, in setting aside time for this type of activity, he believed that he had not only an ethical or moral obligation to his community and to the nation, but also that he would better serve his own patients and the residents whose education he guided by making every effort possible to see that local and national programs for the conservation of eyesight were soundly conceived and intelligently conducted."

Dr. Post is a life member of the Board of the St. Louis Society for the Blind and chairman of the professional advisory committee of the Missouri Committee of the National Society for the Prevention of Blindness. For more than 20 years he has served as a consultant to the National Society, in 1952 accepting election to its Board of Directors. Four years ago he received the Leslie Dana medal in recognition of his many contributions to prevention of blindness.

Among those honoring Dr. Post on this occasion were Drs. Francis H. Adler of Philadelphia, James H. Allen of New Orleans, W. L. Benedict of Rochester, Minn., Conrad Berens of New York, Frederick Cordes of San Francisco, A. Ray Irvine of Los Angeles, Peter C. Kronfeld of Chicago, A. B. Reese of New York City, A. D. Ruedemann of Detroit and Derrick Vail of Chicago.

EYE FACTS—The number of U. S. school children needing eye care is estimated to be 7,500,000; partially seeing children needing special education, 60,000.

Health Department Follow-up of Glaucoma in Oregon

ELEANOR B. GUTMAN, M.D.

Director, Vision Conservation Section
Oregon State Board of Health

Staff nurses have found glaucoma patients eager to learn how faithful and regular treatment can help them to preserve existing vision. Routine visiting of such patients should yield high dividends.*

TWO factors, independent of basic pathology within the eye, influence the progress of chronic glaucoma towards blindness. One is the earliness with which diagnosis is made and medical care instituted; the other is the *continuity* of medical care once undertaken. Based on these factors, glaucoma control—or more specifically the control of blindness from glaucoma—resolves itself into the time-honored procedures of case finding and follow-up.

Glaucoma case finding by mass screening techniques has been effectively demonstrated in the 1949 Philadelphia study. Its importance cannot be underestimated. Follow-up to assure continuity of glaucoma care has been undertaken in many large clinics through the offices of medical social workers. In many areas of the country, however, highly organized glaucoma clinics staffed with specifically oriented medical social workers are not practicable.

Such is the case in Oregon. Here the population distribution is diffuse and

medical specialist facilities follow general population concentrations. Private ophthalmologic care is available in the larger cities. One eye clinic, however, serves the entire state and medical social service is limited. Nevertheless, glaucoma patients need assistance here as elsewhere. Where then can such assistance be obtained? Oregon has a well organized system of local health departments throughout the state. Public health nurses, although not usually grounded in the specifics of glaucoma, are thoroughly familiar with the importance of maintaining treat-



" . . . and sometimes I see colored rings around all the lights." The home visit creates a friendly feeling between patient and nurse.

* A paper presented at the Annual Conference of the National Society for the Prevention of Blindness, New York, March 1953.

ment in such diseases as syphilis, tuberculosis and diabetes. The process of aiding and motivating patients to seek and continue medical services is readily applicable to the disease glaucoma.

Pilot Study

Through the Vision Conservation Section of the Oregon State Board of Health a pilot study has been set up to demonstrate the effectiveness of public health nursing follow-up of glaucoma patients. While the program is eventually slated to accept referrals from private ophthalmologists as well as from the clinic, at present only cases referred from the University of Oregon Medical School outpatient department are being followed. This will help to determine standards and develop patterns of procedure before extending the service beyond a limited group.

The staff of two local health departments—Multnomah County and City of Portland Bureau of Health—are participating in the study under guidance of the director and the consultant of the Vision Conservation Section, State Board of Health. Before embarking on the program local staff members are given extensive orientation in the anatomy, physiology and pathology of glaucoma, and in the various factors which may contribute to a patient's faithfulness or lack of interest in maintaining treatment schedules. Referrals made by the clinic are routed through the Vision Conservation Section to local health departments; public health nursing reports are returned to the clinic for the information of the ophthalmology and nursing staff.

To date 70 glaucoma patients have



Often a member of the family can help with medication; here Mr. N's wife gets instruction from the nurse.

been referred to local health departments during a period of slightly over six months. Visits have been made in 69 of these 70 cases and the patients contacted in all but four instances.

Of the 65 actual contacts, 50 patients have returned to the eye clinic at least once since the nursing visit was made. Seven additional patients are not yet due for their return visit, while only eight have failed to keep their appointments subsequent to follow-up.

These eight "lapsed" patients divide themselves roughly into four cases where illness or infirmity was the cause for failure to return, and four in whom there was lack of interest in, or disgruntlement with, treatment. These latter who might be termed "motivational lapses" constitute a group which challenges the nurse's ingenuity to create a motivating climate on subsequent visits.

Thirteen of the 50 cases in good standing had previously lapsed but returned to clinic after a nursing visit.

In many instances a better understanding of the nature of their eye disease and the implication of interrupted care were sufficient to make the patients resume regular medical visits. In other cases assistance in arranging needed transportation, realigning schedules of other activities, or aid in the technique of self-administering eye drops has been the factor instrumental in re-establishing medical supervision.

Without exception the staff nurses have found that glaucoma patients are glad, even eager, for an opportunity to discuss their disease and to learn more about their own role in preserving existing vision. The threatening concept "you *must* continue treatment or

else you will go blind" needs to be moderated through familiarity with the disease and provision of an opportunity to solve the problems associated with it. Seemingly minor obstacles such as discomfort following the instilling of drops, inconvenient medication schedules, period of waiting at the clinic or difficulty in travel as well as failure to note symptomatic improvement play a large part in determining a patient's response to medical supervision. These are details familiar to every public health nurse and ones with which she is trained to cope. It is felt that routine visiting of glaucoma patients under care is a natural health department function and one which will yield high dividends.

Bill Prohibits Transportation of Fireworks

TWENTY-EIGHT states now have laws banning the sale of fireworks except for public displays under proper supervision. Other states and cities have adopted less restrictive measures. Yet reports of eye injuries from fireworks appear increasingly in the press. This is due largely to the fact that manufacturers are able to circumvent state laws by advertising in various publications and filling direct mail orders.

In North Carolina, for example, one of the states which prohibits general sale of fireworks, the Hospital Care Association of Durham made a survey one year and discovered 751 patients treated by physicians for fireworks accidents. Among the seriously injured were four cases of burns of the eye, two with corneal scars, two resulting in questionable vision of one eye, six resulting in the total loss of vision

of one eye, and nine additional cases involving the complete loss of an eye. It is almost impossible for state or local police to prevent the use of fireworks when they can be mailed or bootlegged into a state, as shown by these tragic examples.

A bill now pending in Congress, HR 116, prohibits the transportation of fireworks into the states which have restrictive laws regarding their sale. This bill has the strong support of the National Society for the Prevention of Blindness and many local agencies concerned with health and safety. It is hoped that all community agencies and individuals who have seen the tragic results of fireworks accidents will inform their Congressmen of their support of this important measure; also that all will work aggressively for enforcement of state control laws and local ordinances now in existence.

Health Department Responsibility for Sight Conservation

EDWARD DAVENS, M.D.

Chief, Bureau of Preventive Medicine
Maryland State Department of Health

Organized community action is required in attacking the problem of sight conservation—a problem which deserves high priority in the balanced public health program.*

IN establishing sight conservation as a health department responsibility, I will pursue two themes: one of these is to positively identify visual impairment as a public health problem of top priority and the other is to explain why public health methods and the services of state and local health departments are essential to the solution of the problem.

Public health is a concept which is not simple to describe. Outstanding definitions from the pens of two leading health statesmen have a common punch line:

C.-E. A. Winslow: "Public health is the science and the art of preventing disease, prolonging life and promoting physical and mental health and efficiency through organized community efforts for the sanitation of the environment, the control of communicable infections, the education of the individual in principles of personal hygiene, the organization of medical and nursing service for the early diagnosis of disease and the development of social machinery which will ensure to every individual in the community a standard of living adequate for the maintenance of health."

Harry S. Mustard: "A health problem becomes a public health responsibility if or when it is of such character or extent as to be amenable to solution only through systematized social action. Its relative importance varies with the hazard to the population exposed. This hazard may be qualitative, in terms of disability or death; quantitative, in terms of proportion of population affected; it may be actual or potential."

The recurring point is that some health problems require organized community action because they are incapable of solution otherwise. Further examination of such health problems reveals a group of specific characteristics which suggest the advisability of a broad group approach to supplement the equally essential individual clinical treatment. Five examples of such characteristics are: widespread prevalence; amenability to prevention; extent of interference with growth and development, education and employment; extent of interference with the public economy in terms of money and manpower; and the complexity of the problem in terms of environmental factors, variety and dispersion of needed services, chronicity, geographic and financial barriers to treatment, and public ignorance

* A paper presented at the Annual Conference of the National Society for the Prevention of Blindness, New York, March 1953.

about currently available preventive and treatment measures.

In establishing the health department's responsibility, we can examine the sight conservation problem for evidence of these five characteristics.

Prevalence of Eye Defects

One out of four (approximately 6,500,000) American children needs eye care. One in every 500 school children (about 60,000) is classified as partially seeing and needs special help in school. Most serious of all, there are 260,000 blind Americans, another 1,000,000 blind in one eye, and 340,000 who have vision that is barely useful. It is an understatement to say that the vision problem is one of wide concern.

Prevention Aspects

It is generally agreed that at least 50 per cent of blindness is preventable by avoidance of infection, by known methods of early diagnosis and treatment, and by safeguarding eyes against accidents in industry, at home and at play. An excellent summary of the prevention of blindness problem¹ was presented at the March 1951 National Conference on Preventive Aspects of Chronic Disease. This statement was prepared by the National Society for the Prevention of Blindness and reviewed by the Division of Chronic Disease and Tuberculosis, USPHS. The relative importance and nature of the various causes of blindness are discussed and preventive measures are outlined for each cause. The study² of Hurlin and associates into causes of blindness among 21,000 recipients of aid to the blind in 20 states also gives excellent data for planning preventive programs. From the group for which a positive etiological classification could be established 1,589 cases were due to

syphilis, 1,551 to trachoma, 429 to ophthalmia neonatorum, and an additional 929 resulted from such infectious diseases as measles, meningitis, scarlet fever, smallpox, tuberculosis and typhoid fever. Accidental injuries accounted for 2,079 cases or 10 per cent, and glaucoma and cataract for about 6,000 or 29 per cent.

It is estimated that 90,000 eye accidents occur annually among school children; 300,000 occur in industrial plants. About 90 per cent of these are preventable.

Interference with Growth

There are few health problems which closely rival visual impairment in interfering with the normal process of growing up. To plunge a child into perpetual night or partial darkness greatly impoverishes the environmental contacts essential to physical, emotional, mental and social growth and development. Normal vision is vital to progress in school and even slight impairment of vision is a real handicap in the learning process, in industry, or in the armed forces.

Cost to Society

Defective eyesight costs our country about 7 per cent of her military manpower and slows down the production efforts of nearly 40 per cent of our industrial workers. To provide even the current inadequate care and education of the blind we are spending an estimated \$125,000,000 annually and the cost to industry resulting from eye injuries is well over \$200,000,000 a year.

Complexity of the Problem

There is urgent need for improved organization of services and better teamwork among the agencies and

professions concerned. The numerous types and uneven dispersion of needed services, case-finding difficulties, unresolved professional jurisdictions, and widespread public ignorance about the nature of the problem and methods of prevention and treatment are problems which cannot be resolved by the individual working alone.

A Balanced Program

Nearly every major activity of a modern state and local health department helps to promote sight conservation: the maternal and child health program; crippled children's services; school health services; accident prevention; environmental sanitation; industrial hygiene; nutrition; communicable disease and chronic disease control.

High quality maternity care for all pregnant women is already showing results in eliminating syphilis and gonorrhea as causes of blindness. Current plans to emphasize the obstetrical factors in premature infant programs will hopefully reduce the number of premature infant births among the 40 per cent of such births where the cause is known and largely preventable.

There are encouraging signs that research studies are closing in on the cause of retrolental fibroplasia, and we can hope that we will soon be armed with the knowledge of how to stop the alarming increase in blindness due to this cause. In the infant and preschool years the promotion of periodic well-child supervision both in the private physician's office and in the child health conference provides the logical opportunity to detect muscle imbalance at an early age and to institute prompt treatment. Continuous well-child supervision, whether it be in the

family physician's office or in the child health conference, is the ideal early case-finding technic for all types of eye defects including refractive error and provides a natural setting for effective follow-up to see that treatment is carried out.

Regular health supervision by the pediatrician, family physician or clinic also provides the perfect chance for parental education on home accident prevention along the lines recommended by the American Academy of Pediatrics.³

School Services

School health services have been and continue to be a focal point for many activities important to sight conservation during the school years. The widespread development of thoughtful daily teacher observation of school children tied to nurse-teacher conferences has evolved a new and very effective screening technic for all types of visual disorder. This has proved to be a productive addition to the routine vision testing of school children which is gradually being performed with greater care by better trained technicians. Follow-up to provide high quality medical diagnosis and treatment is an essential prerequisite for developing educational facilities for the partially seeing child.

School health activities also create a convenient laboratory for testing accident prevention measures and for practical and realistic health education about prevention of visual impairments.

Environmental Sanitation

Environmental sanitation is important both in control of such communicable disease as tuberculosis and ty-

phoid, and of such agents as drugs and poisons. In the field of industrial hygiene both specific occupational hazards to the eyes and general accident control are fundamental. Earlier diagnosis and more adequate treatment of glaucoma and cataract, and such general diseases as diabetes and hypertension, bring a new ally to sight conservation.

The importance of health department communicable disease control activities is evident in view of the prominence of infectious disease as a cause of visual impairment.

Crippled Children's Program

According to the U. S. Children's Bureau⁴ state crippled children's programs have gradually expanded to include children with visual handicaps in addition to the standard orthopedic and plastic conditions. In 1950 a total of 23 states scattered throughout the country made such specific provisions. Most of these states included strabismus, congenital cataract and other diseases of the eye as conditions for which children were eligible for care; nine of them also included refractive errors. Among the 214,000 children who received service under this program about 5,400 (2.5 per cent) were reported with some type of visual handicap as the primary diagnosis.

Maryland is one of the states which includes conservation of vision in all its aspects as a component part of the crippled children's program. The philosophy of the program is in terms of dynamic prevention rather than a salvage operation. This means the systematic application of primary prevention, for example control of syphilis; and secondary prevention accomplished by early case finding and

treatment, for example muscle imbalance detected in a child health conference.

Location of the activity in the same unit of the health department as the maternity, infant and preschool, school, and mental health programs is a helpful circumstance. Case-finding activities in both the preschool and school health programs are closely tied to the provision of diagnostic and treatment services. Since the total school health program is jointly planned and operated by education and health departments, liaison between the diagnostic and clinical and the educational aspects of each case is rapidly improving.

Regionalized Diagnostic Service

Regionalization of specialist diagnostic service is a basic principle we are trying to apply. This has been operating effectively for over 30 years in the orthopedic program. The counties of the state are divided between the two medical schools—Johns Hopkins and University of Maryland. Children seen in a local orthopedic consultation clinic by a specialist from one of these institutions are referred to the crippled children's hospital affiliated with that school. The operation is performed by the same physician who then follows the child in the county clinic. This method provides continuity of care and makes the most effective use of medical specialist resources. It has been successfully applied in other categories of handicap such as hearing impairment and epilepsy, and we are now attempting to establish rural conservation of vision clinics on this basis.

At present there are vision consultation clinics staffed by qualified ophthalmologists in seven counties and an

eighth is opening next month. One of the most satisfactory of these is in Kent County in Maryland's Eastern Shore. The resident physician at Wilmer Eye Institute, Johns Hopkins Hospital, conducts this clinic and the county health officer has worked out satisfactory relationships with the local optometrist who fills prescriptions and fits the glasses for a standard fee. The main source of referral to this vision clinic is from private physicians, from child health conferences, and from the school health screening program. The optometrist also refers to the clinic individuals in whom eye disease is suspected.

Vocational rehabilitation services, in an area where private ophthalmologists are practically non-existent, make full use of the clinic. In addition to the actual medical service, these rural diagnostic clinics serve as a means of tying together the numerous community threads involved in sight conservation. The medical diagnostic setting provides excellent opportunity for planning a special educational program, initiating vocational guidance and training and providing sound educational materials on eye health.

Agency Cooperation

The Maryland Society for the Prevention of Blindness has cooperated in many ways with state and local health departments, particularly in providing leadership to lay groups, supplying excellent educational materials, initiating studies, and assisting with the development of improved screening programs in the schools.

Throughout the state civic-minded fraternal societies and businessmen's clubs have supported sight conservation efforts. The Lions have been

especially helpful both in purchase of screening and diagnostic equipment and glasses for children of needy families. In fact, Lions have been defined by a Maryland health officer as "men with the foresight to conserve eyesight."

We are keenly aware of important deficiencies. In the area of diagnosis and treatment a study⁵ in one county revealed that 47 per cent of children failing the school screening test failed to receive any kind of an eye examination. Only 10 per cent of these were from families unable to afford eye examination; the majority of parents in this group were either unconvinced of the necessity for examination or indifferent. This problem has been tackled by school principals, classroom teachers, and by home visits of the public health nurse with encouraging results.

In one of the western counties an excellent report⁶ by the local director of special education indicated an efficient screening program; 92 per cent of those who failed the school tests actually needed treatment. On the other hand it was estimated that with existing diagnostic facilities it would take each district public health nurse three and one-half years to get her quota of appointments for examination.

Deficiencies in meeting the educational needs of partially seeing children have been recognized recently by the State Board of Education which has appointed a committee to study the best methods of meeting educational needs of all atypical children.

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Anopia—and Fish Lens Protein Injections

THE term "anopia" is derived from the Greek. Strictly translated it means "without an eye, without vision." The 1949 New Gould Medical Dictionary defines anopia: "1. absence of sight, especially that due to defect of the eye. 2. anoopsia."

In 1952 the term anopia was applied by a Brooklyn group to a fish lens protein solution for which a patent was sought and which they reported in *Science*, the official organ of the American Association for the Advancement of Science, as producing the following result upon injection in men and women with cataracts:

"In all cases there has been a clearing of opacities. . . ."

Doubt as to the accuracy and reliability of these observations has been expressed by competent scientists.* Even more serious is the possibility that sight may be endangered by the inflammatory reaction of the tissues of the eyes of patients sensitized to lens

protein. Uveitis and possibly permanent loss of vision might result if the eye becomes hypersensitive to lens protein, so that the patient literally may find himself a victim of "anopia," the state of being without useful sight.

That ophthalmologists have long recognized this grave danger accounts for their unwillingness to continue hazardous experiments on humans following the proof a quarter of a century ago that bovine lens protein was valueless, despite Park Lewis' mildly encouraging report on fish lens protein in 1933. As is well known, Verhoeff and Lemoine in 1923 showed that lens protein could produce endophthalmitis phacoanaphylactica, a severe inflammatory reaction of the eye. Hektoen and Schulkof in 1924 showed that although fish lens protein contains some elements which are specific for fish, it also contains antigenic elements identical to those in the mammalian lens.

How these injections may jeopardize the sight of men and women who grasp at any straw to avoid eye surgery is shown in a report from the January 24, 1953 issue of the *Journal*

* *Journal of the American Medical Association*, June 20, 1953. Report of the Committee on Ophthalmology of the Division of Medical Science, National Research Council, page 707; and editorial, page 710.

of the American Medical Association, published here with permission of the editor:

COMPLICATIONS FOLLOWING INJECTION OF FISH LENS PROTEIN FOR CATARACT

To the Editor:—In an article published in *Science* Sept. 12, 1952, pages 276–278, Shropshire, Ginsberg, and Jacobi reported favorable results in the nonsurgical treatment of cataract with injections of fish lens protein. This treatment received widespread publicity in newspapers and other lay publications. It is, therefore, imperative to warn the medical profession of the possible dangers that may arise when persons who have received this treatment are subjected to surgical removal of cataract, since the repeated injections of fish lens protein may have rendered their eyes hypersensitive to their own lens protein.

I was alerted to the dangers inherent in lens protein treatment of cataract by the unfortunate experience of a patient in whom bilateral endophthalmitis developed following preliminary iridectomies in 1926. The endophthalmitis was accompanied by secondary glaucoma and resulted in total blindness. Several weeks before the operations, the patient had received 36 injections of the Davis lens antigen. This was an extract prepared from beef lenses.

Preliminary experiments on 13 patients were reported by Dr. A. E. Davis in 1922 (International Congress of Ophthalmology, Philadelphia, Wm. F. Fell, page 284). This was followed two years later by a report of a further series of 131 cases (Tr. Am. Ophth. Soc. 22:112, 1924). Davis claimed that the progression of the cataract can be arrested if the treatment is given early, but he advised that "mature senile cataracts should be removed by operation." Several of his patients suffered severe systemic reactions, which, in some cases, necessitated termination of the treatment.

It is interesting to note that, at the same International Congress at which Davis presented his first paper, Verhoeff and Lemoine

read their classical treatise on "endophthalmitis phacoanaphylactica." This term was, in fact, coined by Verhoeff to denote the severe inflammatory reaction occasionally encountered following rupture of the lens capsule either by trauma or during a lens extraction. This uveitis resembles sympathetic ophthalmia clinically, but can be differentiated from it on histological examination of the eyeball.

It has been established that this serious complication can be produced in experimental animals by sensitization to lens protein. This sensitization is tissue specific and not species specific, so that repeated injections of protein derived from fish or other animal lenses may sensitize the human eye to the protein of its own lens.

Recently, a private patient with bilateral immature cataracts received a series of 50 injections of the much-publicized fish lens extract. An intracutaneous sensitivity test performed in the course of this treatment produced a violent local reaction. Despite this, the injections were continued. The patient developed sensitivity to light in both eyes, and later a severe painful inflammation of his left eye ensued. This was caused by a sudden intumescence of the lens and was associated with evidence of uveitis, namely, keratic precipitates and an aqueous ray.

I removed the left lens in capsule. Nevertheless, the uveitis persisted for two weeks, after which time it subsided under the influence of cortisone therapy. Meanwhile, in the right lens subcapsular vesicles had developed, which probably were the cause of the photophobia, since some lens material could easily seep out of the lens into the aqueous through the extremely thin lens capsule. The right lens was therefore removed in capsule, whereupon the photophobia subsided and the eye recovered uneventfully.

To my knowledge, approximately 1,000 persons, all having cataracts that eventually may require surgical treatment, have already been subjected to lens protein injections that have rendered them sensitive to

their own lens matter. It is important for the physician to realize the serious potentialities that sensitization to lens protein may involve and to inquire specifically regarding any former treatment. Most patients will be reluctant to disclose their unsuccessful attempts at medical treatment, both in an effort to avert criticisms and in order to spare the sensibility of their physician. The patient must be made to realize that failure to reveal such information may have a serious effect on the course of his treatment and may even lead to loss of sight.

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An editorial in the March-April 1953 issue of the *Transactions* of the American Academy of Ophthalmology and Otolaryngology, volume 57, reports that the Committee on Ophthalmology of the National Research Council in Washington adopted the following statement:

Because of the total lack of evidence that the lens antigen treatment of cataract, described by Mr. R. F. Shropshire (*Science*, September 12, 1952), has any efficacy; because adequate evidence is now available to the Committee that it is, in fact, without demonstrable efficacy and because treatments of this type have been thoroughly investigated in the past and proved not only invalid but potentially dangerous to the patient, this Committee does not recommend further investigation of this treatment by any agency.

Note: As we go to press three additional cases of inflammation of the eye produced in cataract patients in the course of fish lens protein injections are reported by Goodwin M. Breinin, M.D., in the *Journal of the American Medical Association*, issue of June 20, 1953; page 698.

EYE FACTS—Accidental injuries are responsible for 8 per cent of blindness among children; 9 per cent of blindness among adults.

Eye Tests for Drivers

"At present the average New York motorist who passes an eye test at the age of eighteen or twenty continues to drive for the rest of his life without ever being reexamined as to vision," states a recent report of the Board of City Magistrates of New York City. "Tests conducted in New York City last year by the Greater New York Safety Council, indicated that one-fifth of our drivers have faulty vision."

The Board urges legislation to compel a new eye test each time application is made for renewal of a license to drive. Such a measure, it believes, would enable the Motor Vehicle Bureau to have a check on the eyesight of each licensed driver at least once every three years. If for administrative reasons such a step appears too difficult to apply all at one time, the City magistrates explain that the proposal might be modified by providing that a certificate from a physician specializing in eye conditions be acceptable in place of a renewal eye test at the Motor Vehicle Bureau. Perhaps the insurance companies, the Board suggests, could be induced to give these tests free of charge to each of their assured.

Regarding night blindness, the report says that while a complete test for this condition might be time-consuming, certain quick, easy-to-apply measures now in use could be employed as part of the test for the original license application, serving as clues to conditions requiring further investigation. The Board urged that serious consideration be given to legislative measures requiring this type of test as part of the original qualification for a license.

Dividends from Better Vision

ROBERT FOSTER ASH, O.D.

Binghamton, New York
Visual Consultant, International Business Machines Corporation

Predetermined visual job requirements are not used at IBM. The company prefers to deal with each employee as an individual, analyzing and interpreting his visual capabilities in relation to his own particular job.*

WHEN the vision program was set up at International Business Machines Corporation no one in top management nor among the department managers spoke or thought of it in terms of getting a few more pieces per hour, per man; nor has this attitude ever been evident since. The firm's employees do not consider the program as a plan to speed up work. Over the years they have found that we don't do anything *to* them, we do something *for* them. We want to help them, if they need help, not alone in working comfortably and safely within the plant but in reading at home, in driving their cars, and in other activities.

None the less, we like to feel that the results of our efforts are manifested in production. When employees acquire skillful vision after having experienced blurring and discomfort they are happier in their work; they must be doing better work and more of it; and there is bound to be a corre-

sponding reduction in production costs, material costs, accident costs and general overhead expenses.

Many of these benefits do not lend themselves to exact dollars and cents measurement any more than does preventive medicine. If we were interested in such measurement, production figures before and after the correction of eye conditions would not be readily available, since IBM has no time studies and no piece work.

The most dramatic way to prove the program's worthwhileness would be to put it in reverse; to remove for a period of time the corrective glasses that we are responsible for. But such a test, for obvious reasons, would be neither practical nor advisable. Let this suffice: We do know that anything that benefits the workers helps the business and vice versa.

Skills of Older Workers Needed

The progressive shift in the age distribution of the population is constantly bringing to the fore industry's responsibility to its aging employees. Figures indicate that older people will

* A paper presented at the Annual Conference of the National Society for the Prevention of Blindness, New York, March 1953.

increasingly dominate the population. Our young men are being inducted into the services, and engineers, tool-makers, draftsmen and others with special skills are in short supply. During the last war elderly people with needed skills were recalled from retirement by some industries; in fact, since the advent of America's industrial era much of the responsible work has been done by men and women over 45.

Advancing years bring compensations. Under normal circumstances age brings better judgment, increased aptitudes, fewer mistakes and greater steadiness than are generally found in younger employees. True, personality and emotional difficulties are characteristic of certain older people but these are found, too, in younger groups.

One of the normal physiological changes that is inescapable in middle life, however, is a general lowering of efficiency in the unaided human eye. With advancing years the visual acuity curve is downward and visual interferences increase perceptibly. Today industry has no excuse for being uninformed about the visual adequateness of all workers, not only as to acuity but also the ability of the two eyes to work together as a smoothly functioning team. A vision program can be administered at reasonable cost and with minimum loss of time from the job. Several optical manufacturers supply well planned programs, including testing instruments. We use both the Sight Screener and Ortho-Rater, and of course the Telebinocular is standard equipment in industry and in professional offices. We use parts of the enormously valuable material supplied by all programs and have, from time to time, added innovations of our own. In deference to two of the programs

and to the disparagement of neither, we call ours the *IBM Sight Rater Program*.

Providing Visual Tools

Since our primary motive is to see what visual tools each employee has, to help him to do a day's work safely, efficiently and comfortably, we plan to give the individual most of the attention. If he has good eyes we tell him so. He is proud of his eyes and a word from us substantiating his opinion will please him. If he is developing a visual problem or one has already caught up with him we advise him to seek professional help from someone of his own choosing.

The object of any good eye program is not to place more glasses astride more noses; but we must not lose sight of the fact that the need for corrective glasses in industry is constantly increasing. Paradoxically, eyes in general are better today because our people are healthier; but more of us are doing close work. In the farming sections of the country there is less apparent trouble.

Someone asked an optometric leader: "Isn't it true that 95 per cent of the population have abnormal eyes?" The reply was: "If 95 per cent of the population have anything how can it be abnormal? If 95 per cent had tails, the other 5 per cent would quickly buy tails and hang them on." Surely 95 per cent of the population do not have so-called refractive errors, but many people operate woefully below their visual potential, particularly in speed and span of recognition, reading rate and comprehension.

We do not concur with the once prevalent practice of "weeding out"

workers on the basis of pass or fail standards. The term "sub-standard" in this case is a misnomer in that it implies some physical inferiority. The need for glasses in our present close work environment is no more a sign of physical inferiority than the need for dentures brought about by eating soft foods, or the wearing of shoes because we walk on hard surfaces. All these appurtenances simply assist the individual to adapt himself to the exacting demands of an accelerated civilization.

The sooner we can take the stigma out of *failing* something the sooner we will have the cooperation of the workers and the closer we will be to having each employee working at best visual efficiency. In no case, then, is an IBM worker ever told that his visual performance is not up to the required standard for his department. If we feel he could be benefited, we simply tell him so.

Opportunity for the Handicapped

Our company delights in finding places for the physically handicapped. Thomas J. Watson, chairman of the board of IBM, instituted this policy in the company's Endicott plant during the early years of the business. It has been so successful that more than 700 persons in this classification are now employed throughout the organization.

Blind, legless, armless, deaf, mute and spastic workers as well as employees with other types of disabilities, are regularly putting in a 40-hour week on all types of intricate jobs. Their efficiency is consistently high and they are taking home the same pay that their more fortunate fellow workers get for the same type of job. What does this mean? It means that we believe there is a place in industry

for workers with physical handicaps *so long as we are aware of them.*

Because of this company policy we do not use predetermined industry-wide visual job requirements. We prefer to deal with each worker as an individual human being. We prefer to analyze and interpret his visual findings within the plant, with his own IBM job in mind. If he needs help we try to motivate him to seek it on the basis of his own personal welfare.

Man's greatest visual task is focusing and turning his eyes simultaneously and harmoniously to a given point. If we were a race of Cyclops with just one eye in the center of our foreheads we would have little visual trouble and therefore little need for spectacles. But two eyes working together as a team is another matter. This relationship between accommodation—ability to focus our two eyes on any object, and convergence—ability to turn the eyes to that point of focus, is a delicate one. When in balance these reflexes give us man's greatest asset, single binocular vision. When out of balance, the result may be uncomfortable, unskillful or blurred vision. If we have no visual interferences, what we do with our eyes makes little difference. We can do the plant's arithmetic, assemble fine parts or operate a punch press for hours on end without discomfort.

This being true, we see no sense in having an employee visually adequate for one job but not for another. Our goal is to have each worker at his *top* potential visual efficiency in the plant, driving his car, and at home. That doesn't mean everyone will have perfect eyes. It simply means that each will be as efficient as professional aids can make him. For instance, a man

may be a sweeper in the plant with low-skill visual requirements but at home he may have a hobby of tying flies. Perhaps some industries are not concerned with what he does at home. The IBM human relations program, however, extends well beyond the limits of the plant.

All job advancement is within the plant and, understandably, there are more transfers from plant service—sweepers and cleaners—than from any other department. For that reason, when a worker proves his ability to do more skillful work we want him visually capable of holding down the better job.

Advantage of Continuous Program

We do not believe in a blaze of screening activity for a short time, followed by a long period of inactivity. When stimulation and controls are removed, plants soon revert to their original condition. Because of this, the vision program should be continuous, allowing for an adequate follow-up period after each round of testing.

Vision programs help to create good human relations. For instance, employees often stop the technician and me as we walk through the plant with this: "Say, when are you fellows scheduled to visit my department? I want your report before I spend money for an eye examination." Our employees also feel that this is one of the programs designed to improve their working conditions. Many, including project and department managers, have thanked us for actuating them to go for a refraction. They often say that they had no idea until getting their new corrections how great the need was.

The program has stimulated eye

consciousness within the plant. It is pleasing to find fewer referrals during each succeeding survey. We would feel we were doing a bad job if this were not true, even though the incidence of eye strain, faulty vision, etc., is greater than any other human deficiency. Many of our employees go to see their own refractionists when they experience trouble, without waiting for us to advise them to go. That is the way it should be; another reason for keeping the program continuous, within reasonable limits.

Safety Records Established

IBMers are keenly sensitive to good safety practices, as is evident by their remarkable safety records over the past year. In Endicott plant No. 1, they worked an enviable 12,770,257 man-hours without a lost-time accident. This is a new world's record for light machining and instruments industry. Last fall plant No. 2 in Poughkeepsie won the 13-week New York State Safety Contest with 3,596,090 man-hours without a lost-time accident.

We who are responsible for the eye programs like to feel that we have contributed to these superb accomplishments, even though good vision is only one of many factors that contribute to accident prevention. Accidents are terrible things, gruesome, mangling, dreadful experiences for those who are injured and for those who look on.

It's not the man-hours of labor lost—it's the man!

EYE FACTS—Persons in the U.S. who are blind due to glaucoma now number 32,000, according to recent estimates. The annual incidence is 3,500.

Christmas in July?

MARTHA ELLIOTT

Health Educator

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Will Christmas 1953 bring the tragedies of recent holiday seasons? The experience of the Washington, D. C. Society indicates that July is none too soon to decide on strategy for this year's campaign against toy shooting accidents.

AN epidemic of eye injuries from shooting toys right after Christmas 1951 shocked the Prevention of Blindness Society in Washington, D.C. Ten youngsters ended their holidays in the hospital. Four boys each lost an eye. The others have lesser degrees of vision loss, but may have greater impairment in future.

Ours isn't an isolated instance of the BB gun eye injury epidemic. A statistical interpretation of data gathered by the Wills Eye Hospital three years ago indicates that more than 200 such injuries probably followed in the five weeks after each recent Christmas. So it seems that a country-wide campaign is needed to prevent such needless damage to children's eyes.

Whenever people are brought face to face with a public danger their automatic reaction is likely to be: "There ought to be a law against it!" The Washington Prevention of Blindness Society agrees that ordinances should provide some basic protection. Our experience in improving local police regulations controlling BB guns was summarized in the Fall 1952 Issue of this publication. But we find it is even more necessary and effective to alert parents to the danger of weapon toys and to build up public opinion

toward the elimination of this risk to children's eyes.

Choosing a Slogan

A well-known principle of psychological warfare is that public opinion can be influenced more effectively by a positive approach than by saying "don't do this, don't do that." A slogan found in an old NSPB release, **SAFE TOYS FOR CHRISTMAS**, provided the positive path toward our objective and we adopted it. It is a good slogan—short—timely and, semantically speaking, every word is weighted with pleasant emotional association. Under this chocolate coating the unpleasant connotations of any preventive campaign—the idea that some toys are dangerous, that a thoughtless Christmas gift can bring sorrow and suffering—can be made more acceptable to the public.

We consider the 1952 campaign a success, not only because the after-Christmas BB eye injuries were cut to four, as compared with 10 in 1951, but because thousands of Washington residents were convinced that air rifles, bows and arrows, darts and slingshots are not *toys* but *weapons*. But any public education program must be a continuing process. We have set *Christ-*

mas without one eye injury as our goal. The following summary of methods and media used last Christmas is only a progress report. There is plenty of room for improvement.

Early Planning

The first improvement brings us right back to the title of this article. Yes, July is none too soon for pre-campaign planning. Case histories of eye accidents are invaluable in publicity. Budget must be figured and a sponsor interested or agency appropriation made. Written materials must be designed. Members of campaign committee should be chosen and contacted. Our campaign did not start until November last year because of other staff commitments. As a result there were some house-organ deadlines we couldn't meet, some bill-stuffer opportunities we had to pass up, and we had no speakers' bureau. The timetable for 1953 suggested here will take care of these omissions.

"Who is going to do the work?" Last year the agency staff did it. This year we will start in the first week of October with the formation of a committee. Key people in the community, many of whom helped us with advice last year, will be given recognition and the opportunity to help us actively. Besides the share-the-work angle, community representation on a Safe Toys for Christmas Committee has two other advantages: It interests leaders of the community in the whole field of prevention of blindness and it yields helpful publicity.

Now that we've touched on *when* and *who*, we'll summarize *how* last year's campaign worked through community organization and publicity.

Materials

Personal individualized letters; phone calls; mimeographed letters slanted for each group; releases to newspapers, organization publications, house organs; radio and TV announcements; TV slide with picture of child's eyes and name of Society; fact sheets for radio feature programs.

Campaign poster in red and black on white, 16" x 25": picture of child's face with patched eye; text, "Are You Giving Safe Toys for Christmas?"

Methods and Media

Municipal Agencies: Mimeographed letters to school principals, city and suburban police chiefs, public health nurses. Posters in station houses, libraries, public buildings.

Newspapers: Releases to city and suburban papers, using local material; feature stories, different for each; columnists' comment.

Radio and TV: Individual letters to program directors and public relations personnel, enclosing 40- and 100-word announcements; mimeographed letters to program personalities; TV slide to stations.

Radio Feature Programs: Interview with chairman, ophthalmological section, local medical society; manager of chain of shops selling toys. Talk by popular woman commentator on how to choose safe toys.

Community Organizations: Letters read in meetings; releases used in publications of PTA, Council of Churchwomen, Junior League, Service Guild, Lions, Citizens' and Civic Organizations, Civitan, Optimist, Elks, Council of Jewish Agencies, Board of Trade.

Commercial and Utilities: Posters in shops and windows; posters on dash, also radio announcements on street cars and buses; article in Transit News, and other house organs; giveaway leaflet for public.

Fact Sheet on Safe Toys

In preparing the fact sheet for radio and general publicity use (listed under

materials) we adapted much of the material from the Planning Guide of the National Safety Council's "Safe Toys for Christmas" campaign. Included in this is a table showing toys that are particularly hazardous for children of various ages, and giving suggestions for toys that are suitable. Emphasis is placed on the fact that development and past experiences of the child determine his ability at a given time more than his chronological age. A child must be old enough and developed enough to realize the possible hazard involved in a particular plaything. He should be taught the safe use of any new toy. He should be emotionally stable enough to be dependable even in moments of excited play if he is to have anything which can injure a playmate.

The space available for use of the play equipment or toys should be considered when selecting the toys. A BB gun given a Washington child is an invitation to break the law, since he may not carry the gun outdoors nor shoot it, except on the not very available ranges.

The fact sheet also outlines new developments in toy manufacture that contribute to safety: sturdy construction; no small parts that can become detached; smooth edges, rounded corners; springs strongly enclosed; non-shatterable plastic material (should be carefully investigated, as some plastics are as sharp and dangerous as glass when broken); non-flammable film; well-constructed tools.

1953 Timetable

For this year's campaign we have made up a timetable as a guide to bypass some of the obstacles of last year, and to schedule some new routes:

During July, August and September, for example, we will gather case histories; secure a sponsor for expenses, or get an appropriation approved; design written materials and get estimates.

During October we will prepare and arrange for distribution of letters, leaflets, posters, exhibits and window displays; contact and enlist cooperation of community agencies; complete collection of case histories; produce releases, features and announcements for publication in newspapers, radio and TV, also fact sheets.

In early November a speakers' bureau will be set up by committee members; and cooperation with toy rehabilitation programs established. Before Thanksgiving materials will be delivered to distribution points. The campaign will open officially on November 29th with full-scale publicity via press, magazine, radio, TV and other features as outlined; campaign letters mailed; stores' advertising campaign, speeches, playlets, etc. It will continue through December 25.

Note: Copies of the campaign poster mentioned under materials, with space for imprint of any local agency, can be ordered from the Prevention of Blindness Society of Metropolitan Washington, 839—17th Street N. W., at \$10.00 per 100. Lists will close November 1st.

The Society will also welcome requests for more detailed information on materials and campaign organization.

NEW PAMPHLET

The article on page 95 of this issue, "Helping the Partially Seeing Child in the Regular Classroom," is available in pamphlet form from NSPB. Pub. 156, price 5 cents.

The Sight-Saving Review

Helping the Partially Seeing Child in the Regular Classroom

The Advisory Committee on Education of Partially Seeing Children of the National Society for the Prevention of Blindness, at its 1952 annual meeting, expressed the need for a pamphlet on what the regular classroom teacher can do to assist the partially seeing child for whom specialized services are not yet available. This pamphlet was developed to meet that need.

MOST of the partially seeing children in the United States attend local schools in their home communities. If these children are to receive an educational opportunity equivalent to that of their normally seeing companions, classroom teachers, wherever they are, should have assistance in adjusting all aspects of the school program to the specific needs of the partially seeing.*

In school systems where qualified teachers of the partially seeing are available, classroom teachers not only have ready access to specialized materials and information but also cooperate constantly with the special teachers in planning and executing all phases of the educational program. The purpose of this publication is to present some specific suggestions that can be applied easily by classroom teachers to whom specialized services are not

yet available. Most of these suggestions, when put into practice, will benefit all children in the class and will lessen the possibility of differentiating partially seeing children from their classmates.

Using the Health Record

Individual cumulative school health records are now widely used and most teachers have access to them. One section of the record contains information on the child's visual status and recommendations regarding use of the eyes. In examining the health records, the classroom teacher should note all children who need special attention. Usually several children in a class wear glasses and the teacher will want to know whether they should be worn constantly or only for certain types of visual activities. Instructions of this kind are usually written on the health record. All children who wear glasses need to learn the importance of proper fitting and adjustment of the lenses as well as how to care for them. This information is especially important for

* For educational purposes, a partially seeing child is one who has a visual acuity of 20/70 or less in the better eye after the best possible correction, and who can use vision as his chief channel of learning.

those partially seeing children who need glasses.

Also, on the health record, will be directions regarding any restrictions that are necessary to safeguard the residual sight of the partially seeing child. For example, children with excessive degrees of nearsightedness (high myopia) might not be allowed to participate in physical activities that involve jumping, bending, diving, or body contact. If such specific information is not already entered on the child's health record, the classroom teacher should confer with the nurse or physician serving the school and obtain additional instructions from them.

The classroom teacher herself may contribute valuable information to the child's cumulative health record. Usually one section of the record form contains data on the teacher's observations of the child's behavior in a variety of school situations. If a child manifests any of the following behavior patterns, the teacher should note them on the record so that suitable follow-up procedures can be instituted:

Attempts to brush away blur; rubs eyes excessively; frowns.

Shuts or covers one eye, tilts head or thrusts head forward when looking at near or distant objects.

Has difficulty in reading or in other work requiring close use of the eyes.

Blinks more than usual, cries often, or is irritable when doing close work.

Stumbles or trips over small objects.

Holds books or small objects close to eyes.

Is unable to participate in games requiring distance vision.

Is unduly sensitive to light.

Other signs of eye trouble to be noted are: red-rimmed, encrusted, or swollen eyelids; recurring sties; inflamed or watery eyes; crossed eyes; complaints that the child cannot see well, that he experiences dizziness, headaches or nausea following close eye work, that he has blurred or double vision. Sometimes a visual defect may manifest itself in restlessness, lack of interest in sports or in reading or other activities requiring close use of the eyes. The classroom teacher should be alert to these reactions and record them.

Note.—In considering the procedures that follow, it is well to keep in mind that the special adjustments and materials are designed to help the child use the vision he has to best advantage. They are not necessarily effective in altering the child's visual status.

Adjusting the Classroom Environment

All children should sit so that charts, demonstrations, bulletin boards, and chalkboard work are readily visible and free from glare. The teacher should always keep in mind the importance of placing all work on the cleanest, best-lighted, glare-free panels of the chalkboard, and of using large, clear manuscript or cursive writing, and soft, white chalk.

Preferential seating is especially important for partially seeing children, each of whom will require individual consideration in accordance with the medical diagnosis of his eye condition. For example, the albino, who lacks pigment in the iris of the eye, is particularly sensitive to glare as well as to high levels of illumination; therefore he usually works to best advantage when seated away from the windows

and when all shiny, glossy surfaces are eliminated from his field of view. On the other hand, children with high degrees of astigmatism and certain forms of cataracts work to optimal advantage in the best-lighted portions of the room.

If the child's health record gives no information on preferential seating, the classroom teacher should discuss the matter with the school nurse or medical adviser.

Adjustable furniture is needed in classrooms to obtain the best visual situations for children. All children should be taught to sit erect when reading and to place materials at the best angle for securing comfortable eye focus. If a classroom is equipped with flat-topped desks, then adjustable easels should be used. Simple, adjustable desk easels can be made by the children themselves. Plans for constructing these, as well as a general list of equipment for use with partially seeing children, can be obtained on request from the National Society for the Prevention of Blindness.

Modifying Instructional Methods and Materials

Methods of teaching reading, writing, and arithmetic are the same for all seeing children, but most partially seeing children will need some individual instruction in each of the three major subject matter areas.

Reading materials for all children should be carefully selected to assure large, clear type and pictures; adequate spacing between lines, words, and letters; adequate margins; good quality paper without a glossy finish; and maximum contrast between background and printing. These desirable physical attributes of materials are

essential not only to the ready development of fundamental reading skills but also for the maintenance of maximum visual efficiency in most partially seeing children.

Many partially seeing children will need books printed in 18- or 24-point type; the state or local director of special education will usually furnish, upon request, a list of large-type materials available to classroom teachers.

In the upper elementary grades, when the reading load becomes heavier, readers may be appointed to assist partially seeing children with supplementary assignments. The reader is usually a classmate who is taking the same curriculum and who reads well. In working with the partially seeing child the reader prepares his own assignment at the same time but, except for the actual reading of the material, he does not help the partially seeing child prepare his work. He also relieves the classroom teacher of much time-consuming work and the partially seeing student of possible eye fatigue associated with prolonged reading tasks.

Even in the lower grades partially seeing children can receive needed help from their classmates through use of such standard procedures as arithmetic combination cards, learning games, and spelling drills.

Most partially seeing children should be encouraged to write larger than the average and to use manuscript writing if this is simpler for them. Many school systems now teach manuscript writing to all primary grade children so the teacher does not need to make any distinction between the partially seeing child and his classmates at this level. When cursive writing is introduced, partially seeing children should not be

forced to continue the use of the manuscript form since if this is done feelings of difference may develop and cause maladjustment. The emphasis should not be on a special form of writing, but rather on clarity and proper size. The attainment of these objectives can be encouraged by providing pencils with soft, very black lead, and light cream-colored, dull, unglazed paper.

The amount of copy work should be limited for all children but especially for those with severe visual loss. Partially seeing children can do much of their arithmetic work directly on the chalkboard, thus obviating the necessity of copying the problems or examples and of using the smaller paper and pencil figures. Lists of spelling words, test questions, and homework assignments for the partially seeing should be written in large, clear script or manuscript. The classroom teacher can cultivate the practice of preparing her original copy in the enlarged form; this copy can be given directly to the partially seeing child after the teacher has transferred the material to the chalkboard.

For geography lessons large maps with few details, clearly outlined boundaries, and large, distinct lettering will be necessary if partially seeing children are to profit from use of such supplementary visual aids. These will be a boon to all children in the class.

In some schools it may be possible to obtain a large-type typewriter and to arrange for the partially seeing child to receive instruction in the touch system of typewriting. Not all partially seeing children need this additional skill, but for many it will provide another eye rest activity, since much written material can be prepared

directly on the typewriter. Also, in the upper grades, a portable large-type typewriter can be used in class for taking notes.

Adapting the Daily Program

Because the majority of school children are normally farsighted, prolonged close eye work tends to produce fatigue. Children should be encouraged to rest their eyes frequently by closing them or by looking away from their work and out the windows at some distant object or scene. Also, the teacher should plan the daily schedule so that periods of concentrated close eye work alternate with eye rest periods. A change of focus from desk work to a chalkboard lesson, to suitable arts and crafts or to oral discussion, listening, and physical activity constitutes an eye rest period. The prevalent change from a formal, subject-matter oriented type of program to the socialized, integrated activity or core-curriculum approach tends to reduce the eye load for all children and to provide for more flexible scheduling. The present emphasis on group endeavor rather than on individual competition makes it easier for partially seeing children to obtain assistance from student readers and to substitute manual and auditory experiences for visual tasks.

The partially seeing child may participate safely in most of the regular grade activities, but some substitution should be planned for sewing, mechanical drawing, and other activities demanding close eye work and discrimination of fine detail. So that the partially seeing child may not be deprived of creative art experiences, clay modeling, designing of large murals, easel and finger painting should be included.

In many of these activities all children may participate to advantage.

Routine written homework is being eliminated in many elementary schools and in its stead group projects are being assigned. Usually each member of the group assumes responsibility for making a contribution in line with his potentialities and the resources available to him. Thus, a partially seeing child would be assigned a "listening" type of activity such as analyzing a radio broadcast or interpreting a recording, instead of an encyclopedia research project.

The principles and practices of eye hygiene should be a definite part of the instructional program for all children but they are especially important for partially seeing children who must adjust constantly to a major visual impairment. Material on the function and care of the eyes should be integrated whenever possible into units on health education, and opportunity should be provided at all times to practice good eye health and safety habits in all school activities.

Counseling

A visual problem that may prove to be a serious impediment to one individual may not affect another to any appreciable extent, and the same type of difficulty or even the same degree of difficulty may produce entirely different effects in different individuals. Emotional and social implications of eye defects are numerous and varied, but it is well to remember that what a deformed eye or reduced vision may mean to one individual it may not mean to another.

The reactions of the child's family, the school and community attitudes, and his own feelings about his handi-

cap are major factors in determining the child's total adjustment. The teacher should bend her efforts toward minimizing the child's handicap and emphasizing his assets and abilities. If the teacher manifests positive attitudes of approval, appreciation, and acceptance of the partially seeing child, his classmates will develop similar attitudes toward him.

Respectfully submitted:

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NOTES AND COMMENT

• Laboratory Accidents

An eye was lost recently in a chemistry laboratory explosion in a Pennsylvania high school. In another accident a college senior was temporarily blinded when a beaker of acid which he and his classmate were heating in the college laboratory exploded and splashed their faces.

In the first case, during his teacher's absence, a boy student placed a pan of water outside the window of the laboratory and dropped a piece of sodium into it. Nothing happened. He stuck his head out of the window to see what was going on and then it happened. An explosion sprayed both eyes, his face, neck and forearms with sodium hydroxide and metallic sodium. Some of the sodium burned into his skin. He was taken immediately to his family doctor and on the way a piece of the metallic sodium fell from his face and dropped into his lap burning his clothes. He was then rushed to the hospital, a distance of thirty miles. Treatment by an ophthalmologist was instituted the moment he arrived, but only one eye could be saved. The boy is now undergoing extensive plastic reconstructive surgery to repair some of the damage.

In the second case two chemistry majors were experimenting in the laboratory during their lunch hour when the explosion occurred. They were taken to a hospital and given emergency treatment, then to an eye

specialist. One of the boys was blinded for two hours; the other fortunately escaped injury.

The chairman of the Commission on Conservation of Vision of The Medical Society of the State of Pennsylvania has been in contact with the head of the Department of Public Instruction and a program will be submitted in an effort to prevent, if possible, further tragedies of this type.

• Animal and Human Vision

Contrary to popular belief, rather few animals have eyes with a better performance than our own, and it is interesting to look at a few examples of an animal's sight that is definitely known to be superior, according to an article with the above title in a recent issue of the *British Medical Journal*. An upper limit to the eagle's acuity can be estimated from the diameter of its pupil, applying the usual formula for the resolving power of a telescope, and also from the size of the cones and the focal length of the eye. These estimates suggest that the eagle's acuity is possibly twice as good as ours, but not more.

The cat's reputation for seeing in the dark now rests on sound experimental evidence, the report says. A cat's absolute threshold (the minimum visible intensity of light) is about one-fifth of ours. This is only a slight extension of the range over which the human eye works, for the absolute

threshold is already only 1/10,000,000 of the intensity of a piece of white paper in sunlight. The cat achieves the improvement by enlarging the pupil and by reflecting light back through the retina from the tapetum, so that the light passes through the retina twice instead of once. Both these ways of improving sensitivity must detract from the performance of the eye under conditions of good illumination.

The human eye, then is a magnificent compromise in being almost as good as the eagle's by day, and almost as good as the cat's by night. Insects, however, can see things we can never see. Their acuity is low (one hundredth of ours for the bee), and their sensitivity worse (one-thousandth of ours); but they can detect ultraviolet light and can discriminate it from the light of longer wavelength which is visible to us. They perceive a color we are blind to, but this is quite a simple extension of our power of color vision made possible by the very short distance the light travels inside their compound eyes. Bees also have the ability to detect the plane of polarization of light and the extent to which it is polarized—a thing we can do only with the aid of instruments. Knowing the time of day, a bee can get a compass bearing from one small patch of blue sky, and bees use such bearings to direct other bees from the same hive to rich sources of honey.

• St. Louis Forum

"The Care of the Eyes Throughout a Lifetime" was the subject of the St. Louis Medical Society Public Forum held on March 12, 1953. T. E. Sanders, M.D. acted as moderator and presented some general background of ophthalmology, including the struc-

ture of the eye and how it works and refractive problems. Fullerton Luedde, M.D. discussed the problems of childhood, particularly strabismus. Clyde Milster, M.D. covered the problems of adult life, particularly such diseases as uveitis and trauma. Ruth Freedman, M.D. discussed the diseases of advancing years, such as vascular diseases, cataract and glaucoma. An hour of questions and answers with the questions submitted by the public was one of the most interesting parts of this Forum. Similar forums covering other subjects are held monthly for the lay public by the Medical Society.

• Eyes of School-Age Child

Defective vision is one of the most common problems of school children, states a recent report of the Committee on the School-Age Child. Detection, diagnosis and treatment of children with defective vision is one of the 14 suggested priorities for communities to consider in their present programs.

This committee was created by the Office of Education, the Public Health Service and the Children's Bureau to help states and communities examine their present health programs and to increase these services where desired. Through the committee these three offices of the Federal Security Agency are working together to help build better health for all school-age children.

In its current report the committee recognizes that it is obvious that if children are to progress in school it is necessary that they be able to see well; yet many thousands of children who need glasses do not have them. A concerted effort is needed for the detection and diagnosis of visual impairment; glasses and other corrective

measures as needed should be provided through private and public resources. Children with such extreme impairment as low vision and blindness will at least for a time need the services of a special education program.

Also included among the 14 priorities are: provision of significant experiences for learning to live healthfully in home, school and community; development of better screening techniques for detecting children needing medical attention; development of local resources for diagnosis and treatment; orientation of parents and of school and health personnel in modern concepts of mental health; recognition of the special health problems of the community; elimination of environmental hazards and observance of safety precautions to prevent accidents; and provision for suitable education of children with physical handicaps.

• **Jobs for Handicapped**

More than 300 positions suitable for persons blind in one eye and with good vision in the other are listed in *A Guide for the Placement of the Physically Handicapped*, Part I, *Aircraft Positions*, pamphlet 14-1, published by the U. S. Civil Service Commission, Washington, D. C. Persons in this classification represent a group with very important placement potentialities. Since it is questionable whether or not one-eyed persons develop true stereopsis or depth perception it is not considered wise to place them where this visual skill is needed.

Many of the positions listed as suitable for one-eyed persons are also suitable for those who have impaired visual acuity in both eyes, up to and including the industrial range of blindness. It is pointed out that other

assets, such as intelligence, manual dexterity and experience, can compensate for certain deficiencies of vision. A person skilled in any of the fields of work, even if he has seriously defective vision, may be better qualified for a job than an employee who has perfect visual acuity but who is inexperienced.

As to color vision, the ability of a person to distinguish colors is essential only when efficient and safe performance of the duties depends upon it. The Commission does not require chauffeurs, truck drivers and operators of other motor vehicles in traffic to be able to distinguish colors since it has not been proved that the accident rate of the color-blind is any greater than that of persons with normal color vision.

• **Health Occupations**

About 1,400,000 persons, or 2.5 per cent of the total civilian labor force in the United States in April 1950, were employed in a group of 17 health occupations, according to an article in the February 1953 issue of *Public Health Reports*. These estimates, the article states, are derived from preliminary summarizations of the 1950 Census of Population prepared for the Division of Public Health Methods, Public Health Service. Persons on active duty with the Army, Navy and Air Force and those unemployed are not included.

In 1950 there were 15,476 optometrists; in 1940, 10,237. Physicians and surgeons in 1950 numbered 191,947; in 1940, 165,989. There were 19,147 opticians and lens grinders and polishers in 1950; in 1940, 11,098. Between 1940 and 1950 there was an increase in the total number of women optometrists



Seventeen charter members of the Wise Owl Club at Charleston Naval Shipyard, South Carolina, display their membership pins and certificates after induction into the organization. In this group are shipfitters, painters, riggers, woodworkers, an electrician and a welder. All work under particularly hazardous conditions; all would have suffered loss of vision had they not worn eye protection when accidents occurred. The Wise Owl Club of America, sponsored nationally by NSPB, now has 726 chapters and 4,242 members.

of 262 per cent; of women physicians and surgeons, 54 per cent; of women opticians, lens grinders and polishers, 153 per cent.

Figures compiled by the 1950 census do not agree with estimates from other sources. For example, the estimated number of physicians, based upon reports from the American Medical Association, was 205,300 in the spring of 1950. This figure includes 9,900 retired, or not in practice, and 7,500 in the armed forces, leaving 187,900 in active civilian practice. In the census tabulations almost 192,000 persons in the civilian labor force in April 1950 were reported as active physicians and surgeons.

The census enumerations of several occupations closely allied to medicine are considerably lower than estimates of active practitioners in 1950 available from the professional associations.

For example, the census figure for optometrists is 15,476, while the association figure is 19,724. The figures from the associations include persons in the armed forces and may include some who are retired, inactive, or devoting the major part of their time to other occupations. Adjustment for these factors still shows that the census counts are substantially lower than the estimates from other sources. Further investigation of the census figures will be possible when state tabulations showing detailed characteristics become available later this year.

• Sight Conservation's Future

The future in sight conservation holds improved and expanded facilities for partially seeing children, a program of eye hygiene in every classroom and home and a campaign to acquaint the public with the means of

conserving vision, writes Mrs. Dorothea di Pretoro in a recent issue of *The New Outlook for the Blind*.

An educational guidance program will be included in the school life of the partially seeing child. In high schools students will also receive vocational guidance. Research is expected to yield valuable information for the guidance counselor to impart to the students.

Periodic medical examinations of the eyes will be an important addition to the general public health program. More attention will be given to proper lighting in home and industry. According to Mrs. di Pretoro, larger print in telephone books, in magazines and in newspapers could well be advocated in the general health program.

• New Eyes for the Needy

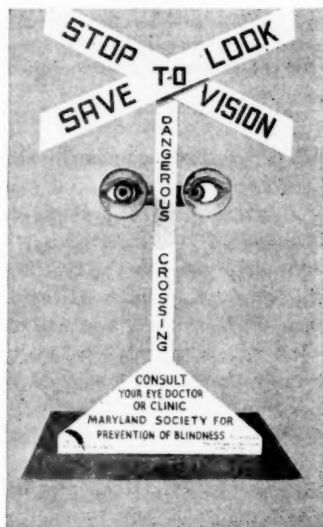
Don't throw away your old spectacles! New Eyes for the Needy, Inc., Short Hills, New Jersey, asks you to send them your old eyeglasses, broken jewelry and bits of gold scrap. Last year nearly 9,000 people who would have been without proper eyeglasses were helped by this non-profit, volunteer organization.

Incorporated in the State of New Jersey, New Eyes for the Needy is sponsored by the Short Hills Junior Service League and is endorsed by NSPB and the Essex County (N. J.) Medical Society. Members of the League sort old eyeglasses and gold scrap; reusable frames and glasses are set aside for future use. Sunglasses, simple magnifiers, simple nearsighted and cataract glasses are distributed through reliable charitable organizations, hospitals and clinics. Metal is redeemed for cash. This is the only source of income to pay for the new

prescription glasses, since New Eyes for the Needy never asks for money.

Work is done in the homes of League members or in donated space. A needy person may apply directly to the organization or to a hospital, clinic, or certified welfare agency which has been allotted a quota by the charity. After screening and examination, he is referred to an optician for glasses, which are paid for by New Eyes for the Needy.

The organization was founded in 1933 by the late Mrs. Arthur E. Terry who, while working in a Red Cross



The Maryland Society for the Prevention of Blindness is using this exhibit extensively in connection with its educational program. The idea was developed at the last NSPB Institute held in New York, and adapted by the Maryland Society for local use. Of aluminum construction, the unit can be taken apart and packed for easy handling. Information regarding the cost and other details may be obtained from Mrs. Edythe K. Moore, executive secretary of the Society, at 411 Equitable Building, Baltimore 2.

Food Station in New York City, noticed many people who needed eyeglasses and could not afford them. Finding no service which would supply this need, she began her own project.

E. V. L. BROWN, M.D.

Edward Vail Lapham Brown, M.D., long active in prevention of blindness activities, and a member of the Board of Editors of SIGHT-SAVING REVIEW, died at his home in Winnetka, Illinois, March 1, 1953, at the age of 76. Dr. Brown was professor emeritus of ophthalmology at University of Chicago School of Medicine and clinical professor emeritus of ophthalmology at (Rush) University of Illinois College of Medicine. He was a past president of the American Ophthalmological Society. In 1951 he was awarded the Leslie Dana medal for achievement in the prevention of blindness. He had served for many years as a director of the Illinois Society for the Prevention of Blindness.

SYLVESTER JUDD BEACH, M.D.

Sylvester Judd Beach, M.D., of Cape Elizabeth, Maine, a valued consultant of the National Society and a strong supporter of educational facilities for partially seeing children, died February 10, 1953 at the age of 73. A graduate of Harvard Medical School, Dr. Beach practiced in Augusta and Portland. He had served as chairman of the section on ophthalmology of the American Medical Association, and as president of the American Ophthalmological Society. He was a member of the council of the American Academy of Ophthalmology and Otolaryngology and served as lecturer in many university courses. He was well known as the author of "Principles of Refraction."

MARJORIE D. SUTPHIN

Members of the National Society's staff were shocked and saddened by the untimely death of Mrs. Marjorie D. Sutphin in an automobile accident on May 23. Since joining the staff as librarian in November, 1944, Mrs. Sutphin had served with efficiency and resourcefulness. Her previous experience in the library of the Kings County Medical Society gave her an excellent background for work in the prevention of blindness field. Many state and local prevention workers and research scientists have benefited from the bibliographies she prepared and the loan of reprints and books from the library which she operated.

Mrs. Sutphin will long be remembered for her unusual capabilities, her unfailing spirit of cooperation, and her friendliness.

APPOINTMENT OF DR. SHY

The appointment of George Milton Shy, M.D., as Chief of Clinical Research of the Public Health Service Institute on Neurological Diseases and Blindness recently was announced. Dr. Shy will guide this research in the new hospital and laboratory which have been constructed at Bethesda, Maryland. He was graduated from the University of Oregon Medical School in 1943, has had some experience at the National Hospital in London, and is a diplomate of the American Board of Psychiatry and Neurology. Recently he was chief of the neurological service at Colorado medical school.

LIGHTING IN GEORGIA SCHOOLS

It is estimated that not more than 5,000 of Georgia's 25,000 classrooms meet the standards for visually adequate environment, according to a recent report of the Georgia Optometric Association. In view of this fact, the Association is inaugurating a statewide program of education.

AROUND THE WORLD

AUSTRALIA

Eye Banks Established—Melbourne and Brisbane now have eye banks to facilitate corneal transplantations. An appeal has gone out for volunteers to bequeath eyes to the Brisbane bank upon death.

EGYPT

Cairo Official Visits NSPB—Fouad Salem Mohammed, social security officer, Ministry of Social Affairs, Cairo, visited NSPB headquarters in March soon after his arrival in New York for a six-month stay in the U. S. Mr. Mohammed, one of three persons now here from Egypt on fellowships from the United Nations, was interested in obtaining information on prevention of blindness programs, although his primary concern is vocational training and rehabilitation of the blind.

Preschool eye examinations, he said, are mandatory in Egypt and are performed by medical specialists at centers located in each of the provinces. There are no special provisions for the education of the partially seeing but there are six schools for the blind, one maintained at government expense and five supported by private philanthropy. Blindness is found largely among the very young and the aged. He said there is no new trachoma and that the major cause of blindness is cataract. Egypt is endeavoring to wipe out disease, illiteracy and poverty; the government is formulating plans to-

ward this goal through its ministries of health, education and social affairs which have a coordinating council.

Ophthalmological Society Anniversary—

The Ophthalmological Society of Egypt celebrated its 50th anniversary during its annual general meeting in Cairo the latter half of February 1953. Lecturers were D. G. Cogan, M.D., Boston; K. Lindner, M.D., Vienna; K. Lyle, M.D., London; L. Paufigue, M.D., Lyons; R. Thiel, M.D., Frankfurt; and P. Thygeson, M.D., San Jose.

Mohammad Khalil, M.D., 15A Sherif Pasha Street, is secretary of the Society. Drs. Cogan and Thygeson are NSPB consultants.

ENGLAND

New Lamp for Eye Photography—Research scientists at the Rugby laboratories of the British Thomson-Houston Company have produced what is believed to be the brightest lamp ever seen on earth, it was reported in *The Optician*, February 27, 1953 issue. The lamp is brighter than the sun; of almost 1,000,000 candle power to the square inch, while the sun's candle power is about 800,000 to the square inch. It retains its top intensity for periods of one-twenty-fifth of a second. Work on the lamp was started with the aim of producing a light which would enable ophthalmologists to take color photographs of the human eye, but it will also be used in many types of medical research, for example in photographing cell growth.

Color-Blind Children—School children in Northumberland are now being tested for color blindness at the age of 10 years, it was recently reported in *The Optician*. Testing at this age may avoid disappointment for the children or parents who might be planning unsuitable professions. In a total of 310 ten-year-old boys, according to the account, 22 were found to have abnormal color vision. Three parents were already planning careers for the boys which would not have been suitable.

Among 264 ten-year-old girls tested one was found to be color-blind. In a group of 317 14-year-old boys tested, 28 were color-blind. Of 312 14-year-old girls tested, two were color-blind. The differences between the two age groups is not considered statistically significant, the report stated.

New Ophthalmic Foundations—The Order of St. John of Jerusalem announces establishment of new ophthalmic foundations in South Africa and in Jerusalem, Jordan. In each instance this is the only hospital in the country dealing solely with ophthalmic cases. Any gifts of journals or publications from organizations or private individuals to help build up an ophthalmological reference library will be much appreciated. Gifts may be sent to the following addresses: For Jordan: The Order of St. John, St. Johns Gate, London, E.C. 1; for S. Africa: The St. John Ophthalmic Foundation, P. O. Box 7137, Johannesburg, Union of South Africa.

INDIA

POB Report from Bengal—Ignorance and poverty are the main causes of blindness in the State of West Bengal,

according to the Association for the Prevention of Blindness, Bengal in its combined annual reports for 1948–51. Cataract is responsible for 45 per cent of blindness in Bengal; glaucoma, 10 per cent. The tragic blindness from keratomalacia occurring mostly in young children is entirely due to insufficient intake of milk. Other causes of blindness include ophthalmia neonatorum, trachoma, small pox, venereal disease, injuries, and quack treatment.

Compulsory vaccination, ocular prophylaxis of the newborn, prompt treatment of venereal disease, ocular inflammations and injuries, and improvement in the standard of living will aid materially in preventing blindness from these causes.

The Association operates three traveling dispensaries which during the years under report assisted thousands of patients. Government officials and others have requested an extension of the term of the dispensaries in their respective areas. Preventive activities have also been carried on in schools, clubs, associations, orphanages and exhibition grounds in villages by means of magic lanterns, movies, posters, lectures and demonstrations.

Valuable as the Association's activities in the State of West Bengal are, the need is for the formation of an all-India body for prevention of blindness as envisaged in the report of the Joint Committee on blindness appointed by the Government of India in 1944. This central body would be the coordinating agent and clearing house in all major matters pertaining to prevention of blindness in India. Such a council has not yet come into being, though Bombay has recently inaugurated the all-India national as-

sociation for the welfare and rehabilitation of the totally blind.

Another need is for accurate statistics on causes of blindness and the number of visually handicapped persons in West Bengal. Although the Association has been endeavoring, through its mobile units, to collect such statistics, it has not been too successful. Its appeal to the Census to enumerate the blind and defectively sighted together with the causes of visual handicaps has not met with good response.

ISRAEL

Eye Care—A great number of new immigrants to Israel from countries such as Yemen, Morocco and other Arab countries have had no eye care before, and many eye diseases such as trachoma, glaucoma and cataract, as well as many cases of high myopia, are now being taken care of for the first time, according to a report by J. Nemuel in *The Optician*, March 13, 1953. The number of opticians in Israel has increased since May 1948, the date of establishment of the State, from 23 to 94, serving a population of 1,630,000, the report says. Opticians are organized in the Professional Opticians' Association in Israel. There is no state law to supervise opticians and lay down who can practice. The Association is filling this gap by accepting as members only those with the necessary qualifications, so that optical work is at a fairly high standard of skill and precision.

Sight testing is done primarily by ophthalmologists and in the eye clinics of the Hadassah Organization and the Workers' Sick Fund.

The Association is fixing and controlling prices for spectacles and serv-

ices. Jewelers and watchmakers who want to practice as opticians as a sideline are not accepted in the Association. Advertising by individual members is strictly prohibited. The Association carries on propaganda for better eye care and has started lectures for apprentices to safeguard the standards of the optical profession in Israel.

UNITED NATIONS

Conference on Physically Handicapped—Miss Marjorie A. C. Young, NSPB's consultant in education, represented the International Association for Prevention of Blindness at the United Nations Second Conference of Non-Governmental Organizations Interested in the Rehabilitation of the Physically Handicapped, February 9 and 10, 1953, at United Nations headquarters. Miss Young explained that the international organization was composed of a group of non-governmental agencies with headquarters in Paris and with members in all parts of the world; and that its three-fold program included research work in medical, clinical, statistical and teaching fields. It is engaged in developing preventive services and restorative procedures, and also encouraging the education of the public as well as of the special groups involved in rehabilitation programs.

Miss Young pointed out the need for making clear the difference between the blind and the partially seeing, from the viewpoint of education, training and placement in various lines of work.

There was discussion about the need for more accurate and more comparable statistics on causes of physical disabilities, and expression of frustration about the lack of data or even

agreement on definitions. Miss Young told about the adoption in 1950 in London by the International Association of the standard dual classification of causes of blindness. The delegates were pleased to know that the Association had made this progress. In the discussion of the need for properly trained teachers of handicapped children, Miss Young explained what the National Society has done to establish competencies for teachers of the partially seeing.

WORLD HEALTH ORGANIZATION

Trachoma—Battle is Joined—"This is still a controversial hypothesis, but however that may be, the most highly qualified specialists estimate that at the present time 15 to 20 per cent of the world's inhabitants are affected by trachoma—that is to say, several hundreds of millions of individuals—so that this disease possibly constitutes the most widespread scourge in the world," writes Dr. Matthieu Jean Freyche, chief of the Epidemiological Information Section of WHO, in the March 1953 issue of *WHO Newsletter*. In Tunisia, for example, where the population numbers only three and a half millions, trachoma and its associated eye troubles cause the loss of more than twenty million working days per year, he says.

The Egyptian organization for combating trachoma may be cited as a model for this type campaign. Recently in Turkey, North Africa and West Africa, four institutes have been set up in Istanbul, Tunis, Rabat and Bamako respectively; they are among the best equipped in the world.

In addition to WHO other specialized agencies of the United Nations have made offers of support, in par-

ticular, the United Nations Relief and Works Agency for Palestine Refugees in the Near East, which is assisting about 800,000 Arab refugees scattered over several countries of the Eastern Mediterranean, and the United Nations International Children's Emergency Fund (UNICEF).

Union Eye Care Center

More than 5,500 persons from 64 different Chicago labor unions and co-ops used the services of the Union Eye Care Center during the first year of its operation. This was reported recently in the *Illinois Labor Bulletin*, official publication of the Illinois Department of Labor. Forty cases of glaucoma were detected during this first year and three malignant tumors.

Sixty-six local unions and one co-op with a total membership of 80,000 persons are now affiliated with the Union Eye Care Center. Families of union members in good standing also are entitled to use its services.

Initial funds to establish the center came from the affiliated organizations. In addition a reserve fund was established in 1952 by some of the affiliates to absorb the trial period operating deficits. The center was organized in March 1951 by a dozen AFL and CIO local unions and a consumers' co-op; in December of that year it served its first patients in headquarters at 343 South Dearborn Street, Chicago.

General operating policies are determined by a board of directors representing the labor and co-op organizations, but the director, Dr. Stillerman, and his associates have complete independence in the practice of medicine at the Center. Thomas J. Burke is its president.

CURRENT ARTICLES

Effect of Alcohol Ingestion on Driving Ability. Results of Practical Road Tests and Laboratory Experiments. K. Bjerver and L. Goldberg. *Quarterly Journal of Studies on Alcohol*. Vol. 11. pp. 1-30. March 1950.

Alcohol had the same effect on vision as the setting of a gray glass in front of the eyes, or driving with sunglasses in twilight or darkness: a stronger illumination is needed for distinguishing objects and dimly lit objects will not be distinguished at all; when a person is dazzled by a sharp light it takes a longer time before he can see clearly again. The effect is probably due to alcohol's interference with the interaction in the retina and in other pathways between the positive or stimulating components and the negative or inhibiting components, as judged from simultaneously recorded electroretinograms. This mechanism most probably explains the observations of Newman, Fletcher and Abramson on the decrease in resistance to glare after alcohol is consumed.

Ocular Manifestations of Trichinosis. M. Croll and L. J. Croll. *American Journal of Ophthalmology*. Vol. 35. pp. 985-992. July 1952.

Trichinella spiralis is a parasitic disease usually introduced into humans by eating of pork and other meats. The *Trichinella*, in the meat as encapsulated larvae, are liberated in the duodenum and intestinal wall.

They mature in a period of 24 hours. Reproduction occurs in the females in from two to three weeks. About the eighth to tenth day after ingestion, the larvae enter the blood stream and are thus distributed to all parts of the body.

Onset of symptoms is sudden and very acute. One of the earliest signs is severe edema of the eyelids, which extends to the surrounding tissues of the face, and marked chemosis and edema of the conjunctiva. This causes the patient to see an ophthalmologist early in the course of the disease. The skin over the upper eyelids is stretched to its extreme limit, causing mechanical closure of the lids. The conjunctiva in severe cases is so edematous that it hangs out of the narrowed palpebral tissue like an apron over the lower lid.

The authors present two case reports. In Case 1 a clinical diagnosis was established, and in Case 2, the clinical diagnosis was further confirmed by biopsy.

Various diseases simulating trichinosis are allergy, sinusitis, kidney disease, periarthritis nodosa, angioneurotic edema, eosinophilic leukemia, dermatomyositis and typhoid.

There is no known effective treatment for trichinosis. The symptoms must be treated as they appear or as anticipated. The authors used antihistaminics in their cases, since it was felt that the infection represented an allergic reaction to the parasite. Penicillin is contraindicated, since there

may be an allergic reaction to the penicillin mold. Local measures include the use of a bland ophthalmic ointment (epinephrine bitartrate ophthalmic ointment, one per cent) with cold compresses and adrenalin packs. Sedation is important to allay the patient's fears. It is also important to reassure the patient that he will not become blind and that the eyes will return to their normal state.

Associated Eye and Skin Manifestations of Systemic Disease. I. Givner. *Transactions, American Academy of Ophthalmology and Otolaryngology*. Vol. 56. pp. 751-780. September-October 1952.

The author discusses a number of systemic diseases with skin and eye manifestations. In studying the effect on the eye of individual amino-acid deficiencies it was found that valine deficiency produced a corneal dystrophy. This change was reversible and disappeared after the administration of valine.

Vitamin A deficiency may produce dry, scaly, loose skin with follicular hyperkeratosis. In the eye, dark adaptation is delayed and night blindness may be complained of. Bitot's spots are found near the limbus as dry patches covered with a peculiar foam-like substance. They occur principally in children and are triangular in shape and have the base toward the limbus. They are not pathognomonic of avitaminosis A, having been reported in the absence of such a deficiency in tropical countries.

Persistent and intractable cases of blepharokeratoconjunctivitis should suggest the possibility of vitamin A deficiency. Xerosis with its change in the epithelium of a metaplasia form

may occur. The first sign is lack of luster. This may be associated with wrinkling of the conjunctiva due to a loss of elasticity, first evident in the palpebral region. In the cornea the earliest changes may be a loss of luster, a dryness when exposed to the air and a reduced sensitivity over the entire tissue. If the condition advances, keratomalacia may develop, particularly in extreme cases of famine.

Fissures at the corners of the mouth can be related to a deficiency of vitamin B₂. Ocular manifestations of ariboflavinosis are best seen with the aid of the slit lamp. There is a superficial vascularizing keratitis. This appears when riboflavin is withdrawn and disappears during its administration. This point is still disputed. Photophobia and dimness of vision not corrected by refraction are the most frequent symptoms. Burning sensations of the eyeballs, roughness of the eyelids and extreme visual fatigue are common. The earliest sign is circumcorneal injection. There is an actual invasion of the cornea by the capillaries from the limbic plexus.

In his discussion of syphilis the author says that of 532 patients with interstitial keratitis 8 per cent had chorioretinitis, 8 per cent had neurosyphilis, 40 per cent had dental stigmas, 35 per cent had bone and joint lesions and 10 per cent had labyrinthine diseases.

When one eye is involved in interstitial keratitis, the disease becomes bilateral in 1 month in 42 per cent and within 10 years in 79 per cent of the cases.

From the ages 5 to 25 is the usual range in which interstitial keratitis may appear.

About 2 per cent of all eye diseases

are caused by syphilis. Lewis observed that in the syphilitic children of infected women, 50 per cent to 75 per cent become afflicted with eye disease.

Berens and Goldberg found the percentage of positive Wassermann reactions in interstitial keratitis to be 53.8 per cent; keratouveitis, 50 per cent; Argyll Robertson pupil, 41.7 per cent; optic neuritis and papillitis, 20 per cent; iritis and iridocyclitis 15.4 per cent; uveitis 14.2 per cent and choroiditis 12.4 per cent.

Road Traffic and Vision. O. D. Rasmussen. *The Optician*. Vol. CXXIV. p. 224. September 19, 1952.

A comparison is made between the regulations governing road traffic and those governing traffic by rail, air and sea. The latter are operated by numerous minute rules and regulations. Some are most strict in their insistence upon efficiency, especially of eyesight. Similar regulations for road traffic are seriously lacking.

Train headlights are relatively no brighter than a car's parking lights, yet cars turn on a stream of searchlights possibly ten times more intense than the train's. The blinding glare reduces vision to zero for several seconds, and longer periods while the acuity recovers, only to be blotted out again and again along busy highways. Instead of one directing mind there are hundreds, and whereas the train has a more or less constant speed, cars have scores of different speeds.

Strict high standards of acuity are laid down for all public and armed services. A railway driver with visual acuity of 6/18 would not be permitted to pass one test (with glasses on) and simply by applying for an annual license, drive trains for the rest of his

life without glasses. Car drivers, however, can and often do similar things.

Visual acuity is normally reduced in poor light and still more by certain colors. In twilight gray paint renders some trade vans and cars indistinct. In general, visibility depends on brilliance or sharp contrasts. Motor manufacturers might be asked to cooperate by putting these facts before prospective buyers.

Eye Protection Program. D. J. Wood and H. Kohn. *Industrial Medicine and Surgery*. Vol. 21. pp. 433-437. September 1952.

The authors describe the eye protection program at the Cleveland Tank Plant of General Motors Corporation. The building of armored military vehicles presents a great potential eye injury hazard. Molten metal splattered from heavy welding operations, flying chips from milling machinery and moving objects which may strike workers are some of the hazards.

All employees at this plant are required to wear a metal-framed, side-shielded safety goggle with casehardened lenses. A trained, full-time optician dispenses and fits all goggles which are issued according to job requirements set up by the safety department. During the year 1951, 1,242 prescription goggles were handled by the plant optician. Of these, 685 were prescriptions issued by ophthalmologists performing refractions in the plant medical department. The remaining 557 either were prescriptions brought in by the employee or obtained by duplicating prescriptions on the lensometer from satisfactory street glasses.

No work days have been lost as a result of eye injuries since the plant

began operating on August 26, 1950. During 1951, 18 employees averted severe eye injuries by wearing proper eye protection. Had each of these accidents resulted in loss of one eye, a total of \$72,450.00 would have been paid under the Ohio Compensation statutes. Had just one of these accidents resulted in loss of both eyes of a 25-year-old man, the disability compensation and medical expenses paid to the individual would have amounted to \$64,983.46. The total cost of the eye protection program for the entire year of 1951 was less than either sum.

Further Efforts to Influence X-Ray Cataract by Chemical Agents. L. von Sallmann. With the technical assistance of C. M. Munoz. *A. M. A. Archives of Ophthalmology*. Vol. 48. pp. 276-291. September 1952.

Intravenously administered cysteine had a strong protective action against radiation damage to the lens and hair follicles of rabbits when the treatment preceded the exposure of the eye to 1,500 r. This protective influence has persisted to the time of this report, at least 18 months.

When cysteine was injected subconjunctivally twice weekly for three weeks after the irradiation of cysteine-pretreated rabbits, the fine cortical opacities were not reduced by the additional therapy.

Subconjunctival injection of one cc. of an eight per cent solution of cysteine prior to irradiation was moderately beneficial in preventing the damage to the lens induced by local exposure of the eye to 1,500 r.

Analysis of microscopically visible changes in the lens, which develop the first two or three weeks after x-irradiation with 1,500 r, showed that almost

all lesions were less pronounced in the cysteine-pretreated eyes than in the eyes rayed before the use of cysteine.

X-ray-induced inhibition of cell division, recovery and compensatory increase of mitotic activity of the lens epithelium differed very little in cysteine-pretreated animals and in non-pretreated controls.

Glutathione and thiourea were less effective than cysteine in increasing the radioresistance of sensitive elements of the lens. Sodium thioglycollate and dimercaprol (BAL) were totally ineffective. Pretreatment with other reducing chemical agents (dihydroxyacetone and tocopherol), with the citrovorum factor, and with cyanide did not reduce the injurious effect of 1,500 r applied locally to the rabbit eye.

New Air Force Eye Examination for Flying. V. A. Byrnes. *Texas State Journal of Medicine*. Vol. 48. pp. 630-634. September 1952.

One of the improvements of the new Air Force eye examination is the adoption of the Armed Forces Vision Tester which is a modification of the Bausch and Lomb Ortho-Rater. Examinations which can be done on it include visual acuity at 20 feet and 13 inches; vertical phoria at 20 feet and 13 inches; lateral phoria at 20 feet and 13 inches; depth perception (using binocular parallax as clue) at 20 feet; prism divergence at 20 feet and 13 inches (not currently in use, but will be as soon as standards have been validated).

To complete the examination for flying, the following tests must also be performed: color vision; accommodation; near point of convergence; rotations of the eyes, including cover test; red lens test; visual field examination; refraction; ophthalmoscopic examina-

tion; examination of the external eye; and determinations of night vision. Of these latter items only two require a large room—refraction and determination of night vision. It was decided to discontinue the testing of night vision as a routine procedure and to use the night vision training program as a substitute. This leaves only one examination — refraction — that requires the use of a 20-foot eye lane. This results in the saving of a great deal of space when facilities for a large number of examinations are required.

It has been demonstrated that a well-trained technician can obtain reliable results with the Armed Forces Vision Tester. This reduces the total requirement for ophthalmologists and flight surgeons to administer the test.

Qualifications for flying have been divided into three classes. Class I now includes the standards for flying training—the highest standards required. Class II standards apply to persons already trained in whom experience compensates for a slightly lower visual efficiency. Class III standards apply to those who fly but who are not in primary control of the aircraft. In all cases requirements for commission and for flying are listed. The standards for flying are either higher than those for commission or are the same. One can be qualified for commission without meeting the requirements for flying, but not vice versa.

Cataract in Industry. Y. K. C. Pandit and R. L. Mendonca. *Proceedings of the Society for the Study of Industrial Medicine*. Vol. IV. pp. 125–132. September 1952.

Dr. Pandit, ophthalmic surgeon, and Dr. Mendonca, medical inspector of factories, Bombay, India, discuss

various types of cataracts caused not only by trauma but by physical, chemical and other agents.

Several varieties of traumatic cataract are common in industry. Some are caused by injuries which do not penetrate the globe but damage the lens. Others result from penetrating injuries.

Irradiation cataracts occur in several occupations such as glass blowing and chain making. They may result from ultraviolet rays, X-rays, radium rays and atomic bomb radiation.

Workers engaged in the handling of chemicals such as mercury, dinitrophenol and thallium may develop cataract.

Observations on the Choroidal Circulation. N. Ashton. *British Journal of Ophthalmology*. Vol. XXXVI. pp. 465–481. September 1952.

In these days of biochemical microanalysis and of virus studies with the electron microscope there has been a tendency on the part of some to deprecate the value of continued anatomic investigations of the eye. Therefore, it is interesting to see this description of the application of the technique of Neoprene casts, the value of which was demonstrated in studying Schlemm's canal and the aqueous veins, to determine the possible existence of arterio-venous anastomoses in the choroidal circulation, both in normal and pathological conditions.

The report includes some beautiful photographs from Ashton's studies. His findings do not confirm the reports of others on the presence of glomus cells and arterio-venous anastomoses in the normal choroid. However, it is thought that such anastomoses may develop in glaucoma and may explain

the anatomical basis for the rise in ocular tension. The author's work points up the great need for further elucidation of our knowledge of the minute anatomy of the eye.

The Changes in Refraction Between the Ages of 5 and 14—Theoretical and Practical Considerations. M. J. Hirsch. *American Journal of Optometry and Archives of American Academy of Optometry*. Vol. 29. pp. 445-459. September 1952.

The author reports retinoscopic examinations of 9,552 randomly selected school children between the ages of five and 14. The mean refractive state decreases in an approximately linear fashion going from about +0.90 D. to +0.40 D. for girls and from between +0.70 D. and +0.80 D. to +0.30 D. for boys. The median refractive state changes in the same fashion, but to a lesser extent, indicating that the change in average (mean) is unduly weighted by the few cases which change markedly.

The distribution of refraction is skewed toward the hyperopic side until the age of nine or 10, is symmetrical at this age, and then becomes increasingly skewed toward the myopic side with increased age. At all ages investigated the range including the middle 50 per cent of the cases is almost the same, and is between 0.54 D. and 0.66 D. The range for the middle 86 per cent of the cases increases from about 1.25 D. for the youngest boys to 1.75 D. for the oldest group, and from 1.50 D. to 1.87 D. for the girls. Thus, variability is slightly greater among girls than among boys and increases between 0.37 D. and 0.50 D. during the age span investigated.

Less than one per cent of the chil-

dren in the five and six year groups have myopia in excess of 1.00 D., while more than five per cent of the 13- and 14-year-olds have this anomaly. The increase in number of myopes seems to occur at about the time of puberty and seems to occur a year or two earlier in girls than it does in boys. The higher hyperopes decrease in number with increasing age, but not so sharply as the number of myopes increases.

Optic Atrophy in Infancy, Childhood, and Adolescence. A Survey of 81 Cases. F. C. Cordes. *American Journal of Ophthalmology*. Vol. 35. pp. 1272-1284. September 1952.

The histories of 81 cases of optic atrophy in infancy, childhood and adolescence observed at the University of California Hospital, San Francisco, between 1920 and 1950 were studied. Of these, 43 (approximately 53 per cent) had primary optic atrophy; 32 (39 per cent) had secondary optic atrophy; and six (eight per cent) resulted from retrobulbar neuritis. The largest single cause of optic atrophy of all types was hydrocephalus (11 cases), with neoplastic disease second in frequency (10 cases). Congenital syphilis was third most frequent cause. Cases of congenital optic atrophy and atrophy in association with hydrocephalus, cerebral aplasia and oxycephaly appeared at an early age. Cases of optic atrophy due to central nervous system lues, neoplasms and trauma were found in the age group of nine to 11 years.

Of special interest was the report from the California State School for the Blind which showed that the percentage of blind with congenital syphilis had dropped from 7.4 per cent in 1930 to 1.1 per cent in 1950. Only one

new case of atrophy in association with congenital central nervous system syphilis has been seen at the University of California since 1945.

Exclusive of the cases of traumatic origin, 35 per cent of all cases of primary optic atrophy showed mental deficiency; this was not recorded in the patients with secondary optic atrophy.

The author concludes that optic atrophy in children may arise from an exceedingly wide variety of causes.

The Physician's Opportunity in Preventive Ophthalmology. I. Givner. *American Journal of Ophthalmology*. Vol. 35. pp. 1253-1262. September 1952.

Internists may aid in preventive ophthalmology by including routine vision records in every complete physical examination. They should also include a Wassermann test routinely, remembering that in order to avoid late occurrences of neurosyphilis, intensive treatment in the first stages of luetic infection should be given. For earlier detection of glaucoma, the author believes that the use of the Berens-Tolman tonometer by the internist should be encouraged. Systemic belladonna and its alkaloids have been known to induce glaucoma in susceptible individuals. Inquiry into the family history of glaucoma should be made before prescribing atropine systematically or instilling mydriatics for routine fundus study. Digitalis and quinine occasionally affect vision. In prescribing reducing diets one should include essentials and not induce nutritional amblyopia. New drugs for weight reduction should be well investigated before released for general use. Cataracts have been produced by dinitrophenol; and hyperthyroidism produc-

ing exophthalmos has been induced by thyroid. Eye complications in diabetes are more in the province of the internist than the ophthalmologist. Control of this disease by diet and insulin is the only means of preventing or at least retarding retinal complications.

Anesthetists should be careful to avoid inadvertent pressure on the eye during closed mask anesthesia. Such pressure has induced central retinal artery occlusion in patients who also sustained blood loss and shock. Corneal abrasions are also commonly produced. Loss of epithelium may occur after ether is dropped into the eye. All of these mishaps are preventable.

Surgeons should give great care and consideration to patients of menopausal age who show eye signs but very few systemic signs of hyperthyroidism, before carrying out thyroidectomy either by surgery or medical means. Malignant exophthalmos may too often be induced.

In the field of dermatology loss of vision in Stevens-Johnson disease is frequently due to neglect of the eyes until corneal complications have already occurred. A small percentage of cases of atopic dermatitis have associated detachment of the retina.

The author suggests that obstetricians keep in mind the possibility that congenital anomalies of the eye may develop if the mother sustains even a seemingly slight illness in the first trimester of pregnancy. Young women who have not previously suffered from rubella should be deliberately exposed to infection before pregnancy. If exposed in first three months of pregnancy, convalescent serum might be tried. If the patient should develop German measles during this critical period, therapeutic abortion should be

considered. Care of the eyes of the newborn by two—doctor and nurse—should be insisted upon to avoid the occasional forgetting of this prophylactic measure in the prevention of ophthalmia neonatorum. Congenitally obstructed tear ducts can frequently be diagnosed in the first few days of life. Syphilis should be treated early in pregnancy; 2.8 per cent of blindness in children is caused by prenatal syphilis. Every premature infant weighing four pounds or less at birth should be under observation by an ophthalmologist; 15 per cent of such babies will develop retrolental fibroplasia.

Pediatricians should see that squint cases are cared for as early as possible. Most scars of the cornea after measles are due to secondary invaders. Patients with this disease should be kept in a darkened room and cautioned against rubbing the eyes. With the use of antibiotics locally, when indicated, many of the ulcers with ensuing scarring can be prevented.

Among the areas in which ophthalmologists themselves can contribute to preventive ophthalmology are glaucoma prevention; removal of molluscum contagiosum and warts at the edge of the eyelids to prevent possible conjunctivitis and keratitis; industrial ophthalmology; ocular surgery; contagious diseases; sterilization of eye solutions; etiologic diagnosis; awareness that heat and light rays may cause macular lesions in the aphakic eye; and recognition of the danger signals of retinal venous occlusion. Ophthalmologists should teach their patients—"If good vision you do prize, keep your fingers from your eyes." Ocular infections may be transmitted by finger-to-eye contamination.

Studies on the Effect of High Oxygen Administration in Retrolental Fibroplasia. I. Nursery Observations. A. Patz, L. E. Hoeck and E. De La Cruz. *American Journal of Ophthalmology*. Vol. 35. pp. 1248-1252. September 1952.

This study was made in the Gallinger Municipal Hospital, Washington, D.C. It was aided by grants from the National Institute of Neurological Diseases and Blindness and the District of Columbia Society for the Prevention of Blindness. From January 1948 to January 1951, 18 of 21 infants who developed retrolental fibroplasia received prolonged oxygen therapy at high concentrations. High oxygen therapy could not be accepted as a causal factor, however, since the smaller infants generally receive more oxygen. To evaluate the possible role of oxygen therapy in retrolental fibroplasia, a controlled oxygen-administration program was instituted.

Seven of 28 infants receiving prolonged high oxygen levels progressed to Grades III and IV retrolental fibroplasia. Of 37 infants in the lower oxygen group none progressed beyond Grade II changes.

The authors say that the mechanisms by which prolonged high oxygen administration might influence the premature retina are: (1) by diminishing retinal blood flow high oxygen might diminish the supply of other necessary metabolites to the premature retina; (2) conceivably prolonged high oxygen administration might alter retinal enzyme systems in the premature; or (3) the transfer of incubator oxygen across the cornea to the premature retina is an undetermined

factor that may further increase oxygen tensions in the retina.

They point out that there is no experimental proof to show that these mechanisms can produce the changes of retrolental fibroplasia. Their data together with data of other investigators, however, suggest strongly that high oxygen administration is a factor in the pathogenesis of the disease. In view of the bizarre manner in which the incidence of the disease fluctuates, additional rigidly controlled observations are necessary to establish this concept. There are now sufficient data to question the advisability of the "routine" use of prolonged high oxygen concentrations in the nursery.

Measurement of the Resistance to the Aqueous Flow by the Electronic Tonometer. Results in Cases of Congestive Glaucoma Before and After Treatment. R. Weekers and E. Prijot. *British Journal of Ophthalmology*. Vol. XXXVI. pp. 511-517. September 1952.

This paper is from the department of ophthalmology of the University of Liège, Belgium. The authors say in summary that the compression test performed with the electronic tonometer makes it possible to measure the resistance to the aqueous flow. This resistance is greatly increased in congestive glaucoma during the hypertensive phase. It is sometimes temporarily increased in the fellow eye, even though the tension in this eye remains normal. Between the hypertensive crises, the resistance to the flow is normal both in the glaucomatous and in the fellow eye. The instillation of pilocarpine restores the resistance to the flow to normal in cases where it restores a normal ocular tension. After

iridencleisis, the resistance to the flow at first falls below normal then returns to normal.

Hexamethonium and Glaucoma.

A. J. Cameron and R. A. Burn. *British Journal of Ophthalmology*. Vol. XXXVI. pp. 482-491. September 1952.

At the Royal Eye Hospital, London, an investigation was undertaken to decide if the methonium ganglion blocking compounds could be administered to cases of vascular hypertension known to be suffering from glaucoma, or to similar vascular hypertensive cases of a glaucomatous disposition although this might not be known, without the danger of subsequent sequelae such as an increase in intraocular pressure.

Increasing doses of hexamethonium bromide were administered intramuscularly to seventeen known cases of glaucoma under treatment in hospital.

In no case was a rise in intraocular pressure noted after any injection. The general and consistent change in each case was a slight fall.

On eleven occasions the hexamethonium was replaced by an injection of distilled water. It was then noticed that the usual fall in intraocular pressure was not so marked.

Contact Lenses. E. F. Constantine. *Public Health Nursing*. Vol. 44. pp. 548-551. October 1952.

The author reviews the history of the development of contact lenses, pointing out that the perfect contact lens has not yet been developed and perhaps never will be, but forward strides are constantly being made.

Most successful users of contact lenses are persons with such conditions

as conical cornea, irregular or cicatricial astigmatism, aphakia with high astigmatism, some cases with corneal grafts, and very high refractive errors. A contact lens may be of value as a protection for the cornea in such conditions as vernal catarrh, trachoma, trichiasis, entropion and exposure keratitis. It may be used in certain occupations to protect the eye from chemical burns. Contact lenses have been used by surgeons in applying mucous membrane grafts to the lower cul-de-sac, and also to prevent formation of adhesions in this region. They have been reported to check nystagmus while being worn, and when tinted to be helpful in albinism. They are useful in such activities as acting, lecturing, driving, flying, sailing, swimming, deep-sea diving, skiing and football. A more recent one is television, where actors find them vastly superior because they eliminate distracting glare caused by spectacle lenses.

However, the largest demand for contact lenses is for purely cosmetic reasons. A recurrent question is the possibility of damage to the eyes by the continued use of contact lenses. Some ophthalmologists advise against them on this ground, but the author says she can find no report in the literature of a case where permanent damage has been done.

The Effect of Intensity of Illumination Upon Speed of Reading Six-Point Italic Print. M. A. Tinker. *The American Journal of Psychology*. Vol. 65. pp. 600-602. October 1952.

A study was made to investigate the relation between level of illumination and speed of reading 6-pt. italic print. As illumination intensity is increased from 1 to 25 foot-candles, speed of

reading 6-pt. italic print increases significantly. Then there is a further slight but nonsignificant gain as the intensity is raised from 25 to 50 ft.c. It appears that the critical level of illumination for reading 6-pt. italic print is somewhere between 10 and 25 ft.c. Study of the curve of improvement suggests that the critical level is closer to 25 than 10. If 10 to 15 ft.c. are added to the critical level to provide a margin of safety, the intensity desirable for adequate perception in reading 6-pt. italic print becomes 30 to 40 ft.c. There is nothing in these data which suggests that higher intensities are needed for the optimal perception of this type.

Visual Defects in the Deaf Child.

E. Stockwell. A. M. A. *Archives of Ophthalmology*. Vol. 48. pp. 428-432. October 1952.

During the past 10-year period 960 children at the Pennsylvania School for the Deaf in Philadelphia have had eye examinations and treatment as the need arose by ophthalmologists in a weekly clinic held at the school infirmary. Analysis of the findings of these ophthalmological examinations shows a higher incidence of refractive errors in this group of handicapped children than has been reported for hearing children of a comparable age group. In the deaf the amount of hyperopia follows the pattern of the strabismic rather than of the nonstrabismic child. The author recommends that every child at the time of admission to a school for the deaf be given a complete ophthalmological examination as part of a routine physical examination, so that an already existent ametropia may be corrected as soon as possible. During his school years periodic oph-

thalmological examinations should be done at regular intervals to help the child maintain his best possible visual efficiency.

Management of Crossed Eyes.

E. G. Gill. *The Eye, Ear, Nose & Throat Monthly*. Vol. XXXI. pp. 597-599. November 1952.

The author believes that active medical management of crossed eyes should begin as soon as the condition is definitely manifested. Medical treatment consisting of atropinization of the eyes, occlusion of the fixing eye and correction of the refractive error should be thoroughly carried out before the third year of life. If medical treatment is not successful in six to 12 months, surgical correction is indicated without regard for the age factor.

Optical Plastics Come of Age.

Safety Maintenance & Production. Vol. 104. p. 31. November 1952.

Over the past few years there has been a quick trend toward plastic safety goggles so that today it would be hard to find a plant of any size in the country with an eye protection program that is not making some use of them. The reasons may be found in their lightness, toughness, durability and ability to resist impact and piercing. They also have unusual resistance to pitting from hot metal chips and metal splashes. They will last about 10 times longer than glass on operations such as grinding and spot welding. Cellulose acetate, acrylic and allyl base plastics are the most widely used. Replacement cost of lenses and complete units of modern plastic safety goggles is extremely low. As to future improvements, the allyl base plastics probably have the best prospects of all

presently available, so far as corrective or prescription lenses are concerned. Allyl base plastic lenses are almost as hard as glass and the lens surfaces are more resistant to abrasion and scratches.

Progress With Color.

H. Ketcham. *National Safety News*. Vol. 66. p. 28. November 1952.

Twenty years ago color was used primarily for eye appeal. Now both color and lighting are used to promote safety, efficiency and morale in industrial planning and plant design.

Recently, a division of Jones & Laughlin Steel Corporation completed a color engineering project and found after the first six months that working time lost through accidents dropped 38 per cent. Improved employee morale reduced absenteeism from about five per cent to less than two per cent. Labor turnover dropped from about 4.5 per cent to less than .45.

The author presents similar examples which illustrate progress with color in public and private transportation on the ground, sea and in the air, and in industry, schools and the home.

Use and Abuse of Ophthalmic Anesthetic Ointments.

G. J. Wyman. *The Illinois Medical Journal*. Vol. 102. pp. 314-315. November 1952.

The author emphasizes the uselessness of and the harm caused by an anesthetic drop or ointment administered by the patient. Recently a survey was made of a prescription shop and the following ophthalmic ointments containing anesthetics were obtained: butyn and metaphen; holocaine and metaphen; pontocaine; nupercaine; atropine, butyn and metaphen; and metycaine ointment.

Experimentally there has been no conflict among investigators; and all recent articles have stressed that the use of topical anesthetics delays the healing processes of the cornea. Common conditions for which these ointments are used are corneal abrasions, chemical burns, ultraviolet light burns, corneal ulcers, foreign bodies and conjunctivitis. The result, the author points out, is almost always a vicious cycle in which the medication relieves the pain, the anesthetic effect subsides, the healing is delayed, there is more pain, hence more ointment is used. Two case histories are presented to illustrate this.

In no other specialty, the author states, are anesthetic ointments used to the extent that they are in treatment of the eyes. He strongly opposes their promiscuous use.

Distance Visual Acuity Test for School Surveys. C. R. Stewart. *American Journal of Optometry and Archives of American Academy of Optometry*. Vol. 29. pp. 551-560. November 1952.

The purpose of the study was to evaluate quantitatively the effectiveness of the distance visual acuity test in identifying school children who are in need of eye care. The data were obtained from school survey records of two schools in Columbus, Ohio. The author presents the results, pointing out first that the efficiency of any test depends upon how the aims of the testing program are defined at the outset. If the aim is to identify those pupils with reduced distance acuity, then it may be assumed that the distance visual acuity test is satisfactory. If, however, the aim is to determine the cause of the reduced acuity,

then the distance acuity test is not satisfactory.

In this study it was found that in a group of about 1,000 school children the distance visual acuity test correctly identified 39 per cent of those with hyperopia. Considering a hyperope's ability to accommodate, the distance visual acuity test does as well or better in identifying them than should be expected. The test identified 48 per cent of those with myopia. Most of the myopes who were not identified were those of a low degree. The test identified 84 per cent of those with astigmatism and 93 per cent of those whose refractive errors were classified as normal.

Using the distance visual acuity test as a single test for determining those pupils who are in need of eye care for one or more of several reasons, 44 per cent were identified. This is significantly more effective than any other single test used, with the exception of the retinoscope test. The author calls attention to the fact that it is frequently difficult to elicit maximum acuity with standard Snellen letters, especially among pupils in the lower grades. He suggests that the Symbol E be used through at least the first and second grades.

Glaucoma Detection Program at Wright-Patterson Air Force Base. Major J. A. Buesseler, USAF (MC), A. C. Andrews and Brig. Gen. O. B. Schreuder, USAF (MC). *Transactions, American Academy of Ophthalmology and Otolaryngology*. Vol. 56. pp. 982-984. November-December 1952.

At this base the screening of civilian employees for glaucoma is conducted by the civilian physicians of the Preventive and Occupational Health Serv-

ices Dispensary using the Berens-Tolman Ocular Hypertension Indicator. The testing is included in the routine pre-employment and five-year multiphasic physical examinations of persons over 40 years of age.

Although the program is still in its infancy at this installation, seven cases, or 2.9 per cent of abnormally elevated ocular tension have already been found among a total of 238 persons tested over 40 years of age. To date only five persons have refused to undergo the simple test.

Report of Committee on Contact Lenses. IV Pan American Congress of Ophthalmology, Mexico City, January 1952. J. I. Pascal and B. Courtis. *Ophthalmologia Ibero Americana*. Vol. XIV. pp. 33-36. Trimestre Quarter 1952.

The Committee on Contact Lenses in submitting its report considered the different types of lenses in use at present: corneal lenses, semi-scleral lenses and regular corneoscleral lenses, all of which can be used without any solution. In the committee's opinion it is not possible to evaluate the differences between the three or four different types of contact lenses at present. There are individual differences among patients which must be considered in the selection of the best types of lenses.

Fitting corneal lenses is easier because there is a smaller area of contact and no solution is necessary. The corneal lens has given satisfactory results in many cases, including those in which the regular corneoscleral lens was not well tolerated.

The committee recommends that patients who have only one eye should not be fitted with a contact lens made of glass but rather plastic. The com-

mittee affirmed that contact lenses have a definite but limited application, being satisfactory in many cases even when they cannot be worn for longer than a few hours. The need for them may extend for only a few hours daily. It is the conviction of the committee that when the contact lens is fitted by a competent technician under the control of the specialist there is no danger of any damage to the eye.

The committee further affirms: (1) that contact lenses are recognized as a valuable auxiliary for the maintenance and improvement of vision; (2) a proper prescription for contact lenses requires in addition to the necessary technical ability, a deep understanding of the anatomy, physiology and pathology of the eye and adjacent structures; (3) that improper fitting of contact lenses may produce considerable injury to the eye and its visual functions; and (4) that unfortunately commercial exploitation of these lenses has frequently taken place—a condition which caused damage to the utilization of this valuable visual aid.

Recovery from Retinopathy in a Case of Diabetes with Simmonds' Disease. J. E. Poulsen. *Diabetes*. Vol. II. p. 7. January-February 1953.

A woman, who had developed diabetes mellitus at the age of nine years, showed diabetic retinopathy with scattered hemorrhages formed as spots, points and stripes predominantly localized to small vessels, when she was pregnant at the age of 30 years. After delivery, she developed typical Simmonds' disease—a pituitary lesion with loss of sexual function, loss of axillary and pubic hair, subnormal basal metabolism, low blood pressure, sensi-

tivity to insulin and amelioration of the diabetes. Within four years the diabetic retinopathy was diminished and six years after the pregnancy no retinopathy was present (no hemorrhages and no exudates). The author concludes that retinopathy is a consequence of metabolic disorder and is reversible.

Your Public Relations is Showing.

L. E. Brown. *New York State Journal of Medicine*. Vol. 53, p. 411, February 15, 1953.

The director of the public relations department of the American Medical Association points out that all organizations and individuals have public relations whether or not they want it or recognize it. He lists five categories of the public attitudes, impressions, or criticisms of American medicine: (1) doctors' lack of personal interest in their patients, (2) the cost of medical care, (3) inability to get a doctor in cases of emergency, (4) waiting time in doctors' offices, and (5) refusal of physicians to participate in worthy community projects.

Mr. Brown adds, "Whether these criticisms are real or imaginary makes little difference. If real, they must be corrected; if imaginary, they must be clarified."

The Action of Cortisone upon Processes of Cicatrization of Corneal Lesions and upon Experimental Corneal Vascularization. G. Bonavolonta, and E. De Berardinis. *Rass. Ital. d'Ottal.* Vol. XXI. p. 225. July-August 1952.

The authors studied the effect of local application of cortisone in the process of healing experimentally induced wounds in the cornea of rabbits.

The wounds were superficial, deep and through the whole corneal thickness. Examination by vital coloration with fluorescein, by the biomicroscope and by histological studies show that the local application of cortisone had a retarding effect, especially in deep wounds.

In a second group of rabbits corneal vascularization was produced by the daily application of absolute alcohol, as proposed by Ehler. Here cortisone led to a more rapid and complete regression of the new-formed vessels.

The results of treatment in laboratory animals corresponded exactly to that seen in clinical practice.

EUGENE M. BLAKE, M.D.

Ophthalmic Fellowship

The ophthalmic staff of the Massachusetts Eye and Ear Infirmary has established a fellowship in honor of Dr. Frederick H. Verhoeff of Boston. The staff has collected about \$60,000 which will be the chief support of the fellowship. Income from the fund will be used to make grants for research and study at the infirmary.

Rehabilitation of Blind

Some 3,700 blind men and women were rehabilitated into successful employment at a total cost of \$3,203,460 in the fiscal year 1952, according to the annual report of the Federal Office of Vocational Rehabilitation, 1952. A total of 23,987 blind persons were referred for rehabilitation during the fiscal year. In concluding the report, Miss Mary Switzer, director of the Office of Vocational Rehabilitation, explains that there is still a big backlog of disabled Americans who need vocational rehabilitation.

BOOKS AND PAMPHLETS

New Means of Studying Color Blindness and Normal Foveal Color Vision. Gordon L. Walls and Ravenna W. Mathews. University of California Press, Berkeley and Los Angeles. 1952. Vol. 7. 172 p. \$2.50.

This interesting monograph is a highly technical discussion of color deficiencies and of theories of color vision. Its reading will prove difficult for one not already familiar with color theories and with color vision terminology. The authors are very competent to write in this field. To one acquainted with color vision, the monograph is well written and the discussion well documented. Dr. Walls is a proponent of the Young-Helmholtz three-component color theory with certain modifications made by him. The monograph gives an excellent summary of the pertinent literature with the authors' evaluation of the same.

Much of the monograph is concerned with the interpretation of "Maxwell's spot," more recently described by Dr. Walter Miles. This spot is a subjective entoptic phenomenon and can generally be seen by persons with normal eyes. When a person is looking with one eye (the other covered) toward a large evenly and brightly illuminated area, a purple filter is quickly placed before the eye. The observer sees then for a few seconds a green halo of about 3 degrees diameter and a bright (usually red) central spot of about $\frac{1}{2}$ degree. When this halo has faded, a neutral tint filter quickly substituted for the purple filter before the eye causes the

halo to reappear but with different hues. The authors believe this halo and spot are caused by a particular distribution of the 3 types of color receptors and are not due to color absorption properties of the retina in the vicinity of the macula. It is the particular colors and shapes of this "Maxwell spot" as seen (or not seen) by persons who have defective color vision that Walls and Mathews consider a new means of studying color blindness. According to the authors, the spot does not occur in deuteranopes (green deficient persons), and its appearance in protanopes (red deficient) and normal persons can be differentiated. The interpretation of the spot, of course, generally requires at the same time other more nearly standard color vision tests, some of which the authors describe and have used. The scope of the monograph is more than just a description and interpretation of the "Maxwell spot." There is a thorough discussion and elaboration, with supporting data, of color anomalies, of their possible genetic origins, and of the nature of color vision from the authors' point of view.

The method of using the "Maxwell spot" is not proposed for routine testing or for screening purposes of color deficiency. It only remains a possible method of studying those deficiencies, and the authors suggest that other investigators take up the study where they left off.

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OFFICE MANAGEMENT OF OCULAR DISEASES.

William F. Hughes, Jr., M.D. The Year Book Publishers, Inc., Chicago, Illinois. 1953. 452 p. \$9.00.

In this book Dr. Hughes has brought together current diagnostic and treatment procedures of practical value to the busy ophthalmic practitioner in his own office. Only a minimum amount of basic science material has been included. Of some interest to prevention of blindness workers are the discussion of glaucoma and the outline of the treatment of both mechanical and chemical eye injuries. In discussing first aid and early treatment for chemical burns of the eye, the author urges that copious irrigation with water or with any bland fluid close at hand is much more effective than the use of an ideal solution after much delay. He points out that the victim can put his eye under the water tap immediately while holding his lids apart or he can duck his head into a bucket of water while blinking. After this emergency first aid, more thorough irrigations can be performed by the nurse or the physician in the accident room.

The final chapter on preparation of ophthalmic drugs and the ophthalmic formulary which follows will be of particular value to medical practitioners.

SIDE EFFECTS OF DRUGS. L. Meyler, M.D. Elsevier Publishing Company, New York. 1952. 268 p. \$5.50.

Drugs with powerful action should not be used until the indications for their administration are clear. The best effect may then be expected, and at the same time there is the smallest risk of side effects. Dr. Meyler, con-

sulting physician at Groningen (Netherlands), points out that no doctor would think of administering salvarsan for a mild attack of influenza. Why then give sulfonamides or penicillin indiscriminately? They are equally illogical and the harmful sequelae may be equally great.

In this book the author has assembled known facts regarding side effects of the various drugs. The symptoms mentioned are not the common reactions to be expected; most of the side effects rarely occur; in fact, many have only occasionally been described. Many are allergic in character and the most different may give rise to similar symptoms.

The text is divided into 25 chapters based on various drug groups, each chapter followed by an extensive list of references. The material is presented in concise, orderly fashion, reflecting systematic research of the literature.

A FURTHER STUDY OF VISUAL PERCEPTION.

M. D. Vernon, M.A. Cambridge University Press, New York. 1952. 300 p. \$7.00.

A reassessment of the material in the author's earlier book, *Visual Perception*, is presented in the light of more recent thought and new experimental data. A considerable part of the first book, published in 1937, dealt with the work of the Gestalt psychologists. Their experimental results and theories, the author now states, perhaps after all did not indicate a fundamental basis for the understanding of the nature of perception. She presents certain large propositions as to the fundamental nature of the perceptive process, in particular emphasizing "the general extraordinary unlikeness

—so commonly overlooked in everyday life—of the perceived field to the stimulus field."

Various chapters of the book deal with the perceptual process; determination of form; spatial perception; the constancies; functions of framework in psycho-physical experiments; perception of movement; Michotte's studies of some intrinsic phenomena of experience, and the influence of internal and individual factors upon perception. Illustrations, a comprehensive reference list and an index of authors add to the text's value.

INDUSTRIAL SAFETY AND HEALTH HANDBOOK.

By the publishers of Occupational Hazards. Industrial Book Co., 1240 Ontario St., Cleveland 13, Ohio. 1952. 800 p. \$25.00.

Designed as a "safety assistant" this book gives basic facts classified in 10 sections, indexed and color-tabbed. Under such headings as administration, protective equipment, mechanical safety, skin diseases, airborne hazards, housekeeping, etc., it outlines in non-technical language much useful information that will be particularly valuable for the safety director, the small plant manager, and others charged with responsibility for health and accident prevention programs.

INTRODUCTION TO EXCEPTIONAL CHILDREN.

Revised edition. Harry J. Baker, Ph.D. The Macmillan Company, New York. 1953. 500 p. \$5.00.

In the ten years that have elapsed since the first edition of this widely used text many advances have been made not only in education but in the related fields of medicine, public health and child psychology. In the preface to this revised edition the

author states: "In order to give an up-to-date account of progress, the new sources of research and of publications by specialists and authorities have been reviewed, and the trends of their thinking have been noted."

Although this statement may apply to most of the chapters in the book, it does not apply to those on "Defective Vision" and "The Partially Seeing." In the latter, for example, no references more recent than 1939 have been cited and the textual material and statistics are therefore geared to the past rather than to the present.

Several significant developments related to educational placement and management of the partially seeing have occurred during the past fifteen years. It is hoped that the next edition of this text will present up-to-date information on visual problems and on the education of partially seeing children.

TRANSACTIONS OF THE OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM. Vol. LXXII. Session 1952. J. & A. Churchill, Ltd. London. 1952. 744 p. \$6.00.

The proceedings of the 72nd session of the Society are included in this volume, together with proceedings of affiliated societies, 1951-52. Among the papers of particular interest to prevention workers is a report by Roche of Dublin, of careful ophthalmological examinations of 150 premature babies who were followed up for a period of six months and among whom no retrolental fibroplasia was found. Roche reported that the only case of retrolental fibroplasia he had seen in Ireland was a baby who was born in Manchester of English parents and brought to Ireland at the age of

four months. In discussing cases seen in Birmingham since 1946, Evans reported the highest incidence of such cases in 1949. In premature baby units where oxygen administration was reduced to a minimum, no further cases have occurred, but cases have occurred in units still using a good deal of oxygen.

IV PAN-AMERICAN CONGRESS OF OPHTHALMOLOGY. MEMORIAS. Mexico City 1952.

Three volumes comprising a total of 2272 p. in Spanish, Portuguese and English. Apply to Thomas D. Allen, M.D., 122 South Michigan Avenue, Chicago 3, Illinois. Three volumes \$25.00.

Four articles contained in these three volumes are of special interest to prevention of blindness workers:

Estudio Estadístico de la Refracción en Escolares Mexicanos. L. S. Bulnes, P. Cornejo, R. Figueroa and G. Román y Carrillo. p. 939.

Between the years 1949-1951, 441 Government Grade-Schools in the urban zone of the Mexico Federal District were visited to study 48,913 pupils of the third grade. Among these pupils there were 12,280 who were visually deficient; 6,503 pupils could be thoroughly studied ophthalmologically and provided with eyeglasses; in this latter group there were 1,558 boys (1,318 isometropic and 240 anisometropic) and 4,835 girls (4,179 isometropic and 766 anisometropic). The age of the school children studied ranged between 7 and 15 years with a predominance of 9- and 10-year-olds.

Prevention of Blindness—A Public Health Consideration. Evelyn M. Carpenter, Philadelphia Committee for the Prevention of Blindness. p. 970.

The author believes that prevention of blindness is a public health problem and should be treated within the framework of public health programs. The keynote to a prevention of blindness program is awareness—to causes of blindness and measures for control; to symptoms which if untreated may lead to blindness; and awareness of physicians, nurses, social workers, teachers, industrial workers and the public. The author cites the experiment in glaucoma casefinding initiated by the Philadelphia Committee for Prevention of Blindness in which 12,500 persons 40 years and older in various types of industry were given eye examinations by ophthalmologists.

The Public Health Aspects of Sight Conservation. A. L. Chapman. p. 976.

Public health administrators' activities in the field of sight conservation include accident prevention and early casefinding. The author cites three communities in which health departments, in cooperation with other agencies, have reduced the number of accidents by 50 per cent within a two-year period. There are at least three instruments now on the market which make it possible to screen people for visual defects. In Alexandria, Virginia, the Health Officer screened 2,624 persons for various diseases. He found 611 persons who had visual defects. They were sent to their own doctors for diagnosis and treatment.

Injuries of the Eyes in Childhood. L. P. Glover. p. 988.

A study in Altoona, Pennsylvania, of 156 cases of injury to the eyes of children under age 16 is presented. The missiles involved, in order of frequency, were BB shot, stones, balls,

apples, arrows, slingshots, paperwads, marbles and rubber bands. Household implements causing injuries included tools, knives and scissors and miscellaneous objects. Other objects were explosives, wire, nails, chips of china, steel, sand and glass, chemicals, wood, bottles, fingernails, claws and other miscellaneous objects. Of the 156 injured eyes, 25 had to be enucleated; five other eyes are sightless; seven patients can see hand movements only; six others have LPP vision only. There is a total of 43 or 27.6 per cent either blinded in one eye or with very little vision in the injured eye; one is blind in both eyes. In addition, 12 children have vision in the injured eye of 6/21 or less. The author emphasizes the need for education of parents and the public in preventing these accidents in children.

COWDRY'S PROBLEMS OF AGEING. Biological and Medical Aspects. (Third edition.) Edited by Albert I. Lansing, Ph.D., Washington University, St. Louis. The Williams & Wilkins Company, Baltimore. 1952. 1061 p. \$15.00.

Forty-eight authorities contributed to a discussion of both normal and pathological aspects of ageing. The chapter on the eye by Jonas S. Friedenwald is of particular interest. He compares the expectancy of sight with the expectancy of life and indicates that the normal life span of the eye as a functioning organ exceeds that of the body as a whole. Statistical data based on the 1910 census show that the number of survivors with vision would not reach zero at an age younger than 120 or 130 years.

Friedenwald points out that the characteristic senile morphological and

chemical changes of the ocular tissues may be summarized as increased density, loss of water, increased interstitial fibrillar tissue, accumulations in some portions of the organ of an increased amount of inert material, loss of fat and of elasticity, together with isolated examples of some rather bizarre forms of tissue atrophy.

JOINT FUND RAISING

"Today, we are experimenting with joint fund raising for specialized service organizations in our chests and councils and community funds," says C.-E. A. Winslow, Dr. P. H., in his recent publication, *The First 50 Years of the New York Tuberculosis and Health Association*. "Even on the fund raising level, however," he emphasizes, "it is unreasonable to expect that those devoted to causes which have a particularly effective appeal, such as tuberculosis, cancer, and poliomyelitis, will abandon that appeal for a vague and undefined general welfare fund. If they should do so, it is likely that the total sums of money available for all would be substantially reduced. Business management is one thing—social motivation is another. How to balance them wisely is one of the major challenges of the future."

PRETTIEST GIRLS WEAR GLASSES

"A pretty outfit, a pretty girl, remain just that, minus or plus specs," says Beth Harber, health and beauty editor of *Seventeen*. In an article in the February 1953 issue, she encourages girls who need glasses to wear them, pointing out that for some time these eye helps have been as decorative and fashionable as jewelry and they are becoming more becoming every year. Four attractive models are pictured wearing glasses just as they do in private life. The article also includes many good suggestions about eye care and protection.